

INCREASING AWARENESS AND KNOWLEDGE ABOUT OVARIAN CANCER TO
ENHANCE HEALTH OUTCOMES OF WOMEN

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ABSTRACT

Ovarian cancer is the fifth leading cause of cancer death among women in the U.S. and kills approximately 14,000 women each year (Nezhat et al., 2015). Survival increases with early diagnosis; the five-year survival rate in stage I is 90%. Symptoms are vague and common to many health diseases, which may well explain why upwards of 70% of women with ovarian cancer are diagnosed at stage III or IV (Slatnik & Duff, 2015). Preventative guidelines in the U.S. do not recommend screening for ovarian cancer in women of average risk (AAFP, 2016b; ACOG, 2011; Doubeni et al., 2016; Moyer, 2012; NCCN, 2015; Qaseem et al., 2014; Wilt et al., 2015). A lack of screening recommendations and a subtle presentation point to the need for greater healthcare professional recognition of symptoms and risk factors of ovarian cancer, which can then lead to a prompt diagnosis.

While healthcare professionals have the opportunity to improve women's health, gaps in knowledge exist related to ovarian cancer risk factors and symptom recognition (Gajjar et al., 2012). Continuing education improves healthcare professionals' performance and patient health outcomes (Cervero & Gaines, 2015). Increasing healthcare professionals' knowledge of ovarian cancer may help to detect ovarian cancer in earlier stages and enhance health outcomes of women.

Based on the need for an increase in awareness and knowledge among healthcare professionals, a local ovarian cancer conference was developed and offered to healthcare professionals. The conference focused on presenting ovarian cancer risk factors and symptoms. Attendees were provided with an ovarian cancer resource for patient education.

The conference was evaluated through pretests and posttests and a conference evaluation survey. Data was collected the evening of the conference with 29 attendees responding. After

the conference, correct responses increased in the areas of risk factor and symptom recognition.

The number of correct responses increased from 106 on the pretest to 122 on the posttest. In

regards to ability to educate women about ovarian cancer, 62% of respondents indicated that they

were “very confident” in their ability.

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CHAPTER ONE. INTRODUCTION

Background and Significance

Ovarian cancer is the deadliest of all gynecologic cancers and the second most common (Carlson, 2016; Chen & Berek, 2015; Doubeni, Doubeni, & Myers, 2016; Nezhat, Apostol, Nezhat, & Pejovic, 2015). A woman's lifetime risk of developing ovarian cancer is 1 in 76 or 1.31% (ACS, 2016; National Cancer Institute, 2015). Each year in the United States (U.S.) there are approximately 22,000 new cases of ovarian cancer diagnosed. Approximately 14,000 women die of the disease each year, making it the fifth leading cause of cancer death in women (Crull, Mayer, & Jessup, 2014; Nezhat et al., 2015). The average age of women at diagnosis of ovarian cancer is 63 years (Crull et al., 2014).

Ovarian cancer survival increases with early diagnosis. The five-year survival rate of stage I ovarian cancer is 90% (Carlson, 2016). The five-year survival rate of stage III and of stage IV ovarian cancer is 20% and 6%, respectively. More than 70% of women with ovarian cancer are diagnosed at stage III or IV while only about 30% are diagnosed at stage I (Slatnik & Duff, 2015). Early detection leads to better outcomes.

Symptoms of ovarian cancer are vague and understated—adding to the lethality (Slatnik & Duff, 2015). Preventative guidelines in the U.S. do not recommend screening for ovarian cancer in women of average risk (AAFP, 2016b; ACOG, 2011; Doubeni et al., 2016; Moyer, 2012; NCCN, 2015; Qaseem, Humphrey, Harris, Starkey, & Denberg, 2014; Wilt, Harris, & Qaseem, 2015). A lack of screening recommendations and a subtle presentation point to the need for greater healthcare professional recognition of symptoms and risk factors of ovarian cancer, which can then lead to a prompt diagnosis.

The Ovarian Cancer National Alliance (OCNA) ranked each state in the U.S. on quality of care of women with ovarian cancer. Rankings were based on access to care, education and awareness, quality of life, and research support. The state of North Dakota scored 50th out of 51 states (including the District of Columbia) on the OCNA report card (OCNA, 2016). North Dakota's poor ranking indicates the need to improve the quality of care for women with ovarian cancer in the state.

Problem Statement

Despite advances in healthcare throughout the years, ovarian cancer remains the most lethal gynecological cancer. Educating healthcare professionals about ovarian cancer offers an opportunity to learn or refresh knowledge about risk factors for and symptoms of ovarian cancer. Healthcare professionals can use this knowledge to aid in early detection and effect patient outcomes.

Project Description

The purpose of this project was to increase awareness and knowledge of ovarian cancer among healthcare professionals. An ovarian cancer educational conference was designed and offered to healthcare professionals. The following objectives were used to guide the project: 1) design and organize a local ovarian cancer educational conference for healthcare professionals, 2) increase awareness and knowledge about ovarian cancer among regional healthcare professionals, and 3) provide healthcare professionals with a resource for patient education. The project's design is explained further in Chapter 3.

CHAPTER TWO. REVIEW OF THE LITERATURE

Introduction

Among women, ovarian cancer is the fifth deadliest cancer and is the most lethal gynecological cancer (ACS, 2014; Doubeni et al., 2016). The American Cancer Society (2014) estimated that in the U.S., 22,280 women would be diagnosed with ovarian cancer and 14,240 would die from the disease in 2016. Among women worldwide in 2008, ovarian cancer was ranked the seventh most common cancer. In the same year, there were 225,500 new cases of ovarian cancer diagnosed throughout the world (Carlson, 2016). Very little improvements have been made on the incidence and mortality rates of ovarian cancer in the past forty years (Doubeni et al., 2016).

Ovarian cancer affects one in 76 women (ACS, 2016; National Cancer Institute, 2015). Incidence increases with age and the disease is more commonly diagnosed after menopause, most commonly in women 55-64 years of age (Doubeni et al., 2016; Rooth, 2013). Besides age, other risk factors include family history, reproductive history, use of hormones, and lifestyle choices (Carlson, 2016; Chen & Berek, 2016; Rooth, 2013). The financial burden of ovarian cancer on a woman is significant and is usually upwards of \$100,000 (Urban, He, Alfonso, Hardesty, & Goff, 2015). Presenting symptoms are often vague and nonspecific (Slatnik & Duff, 2015). An early diagnosis is often related to a more favorable outcome (Doubeni et al., 2016; Rooth, 2013). In women of average risk, screening for ovarian cancer is not recommended (AAFP, 2016b; ACOG, 2011; Doubeni et al., 2016; Moyer, 2012; NCCN, 2015; Qaseem et al., 2014; Wilt et al., 2015). Most diagnoses of ovarian cancer are made in later stages (Slatnik & Duff, 2015).

Healthcare professional is a broad term. For the project, the term healthcare professional is defined as individuals from the following groups: physicians, nurse practitioners (NP), physician assistants, nurse midwives, nurses, pharmacists, nursing students, and pharmacy students. Individuals in the aforementioned groups are likely to provide care to women and are in a position to provide education.

A primary care provider is often “the entry point for substantially all of the patient’s medical and healthcare needs” (AAFP, 2016a). NPs may provide primary care to patients (AAFP, 2016a). NPs “focus on health promotion, disease prevention, and health education” (American Association of Nurse Practitioners, 2017). Since primary care NPs are often the gatekeepers into the healthcare system and the NP profession emphasizes health promotion and education, NPs should be knowledgeable about ovarian cancer.

The project’s purpose is to provide an educational opportunity about ovarian cancer to healthcare professionals. Through an opportunity to learn, it is hoped that knowledge is gained and, in the future, health outcomes of women with ovarian cancer are improved. This chapter is a review of literature about types of ovarian cancer, tumor staging, risk factors, symptoms, screening recommendations, diagnosis, healthcare professionals’ knowledge of ovarian cancer, women’s knowledge of ovarian cancer, and continuing education. The framework that will guide this project is also discussed.

Ovarian Cancer

Tumor Types

Three main types of ovarian cancers exist: epithelial, germ cell, and sex cord-stromal tumors. Tumors are categorized based on the types of cells and tissue from which they are derived (Rooth, 2013). Epithelial ovarian tumors develop from epithelial cells on the surface of

the ovary. Epithelial tumors are the most common type of ovarian cancer, making up 90-95% of ovarian cancers (Carlson, 2016; Chen & Berek, 2016; NCCN, 2015). The remaining 5-10% of ovarian cancer is either germ cell tumors or sex cord-stromal tumors (Chen & Berek, 2016). Germ cell tumors develop from primeval germ cells of the ovary (Gershenson, 2016a). Sex cord-stromal tumors arise from gonadal stroma and sex cords (Gershenson, 2015).

Detection and diagnosis of ovarian cancer are the same for the three tumor types. Diagnosis of tumor type is made by histological examination, often during surgery (Chen & Berek, 2016; Gershenson, 2016a; Gershenson, 2016b). Sex cord-stromal tumors are often diagnosed at an earlier stage than epithelial tumors (Gershenson, 2016b). Germ cell tumors are often diagnosed at stage I (Gershenson, 2014). Germ cell tumors are more likely to develop in women between 10-30 years of age (Gershenson, 2016a).

Treatment of ovarian cancer varies depending on tumor type and stage (Rooth, 2013). Treatment of malignant germ cell tumors is similar to treatment of malignant epithelial tumors (Gershenson, 2014). Malignant sex cord-stromal tumors are most often treated solely with surgery (Gershenson, 2016b).

Staging

The outcome of an ovarian cancer diagnosis often depends on the tumor stage. In Stage I, the cancer does not extend beyond the ovary(s). In Stage II, the tumor involves extension beyond the ovary but is limited to the pelvis. A diagnosis of Stage III ovarian cancer denotes that the tumor extends outside the pelvis and includes involvement of regional lymph nodes. Distant metastasis is requisite for a Stage IV classification (Doubeni et al., 2016; Rooth, 2013).

Survival rate often depends on cancer stage. The overall five-year survival rate of women diagnosed with ovarian cancer is under 45% (Carlson, 2016). In women with stage I

ovarian cancer, the five-year survival rate is 90% (Carlson, 2016; Slatnik & Duff, 2015). The five-year survival rate of stage IV ovarian cancer is much lower, at 6% in many cases. More than 70% of women with ovarian cancer are diagnosed in later stages (stage III or IV), while only about 30% are diagnosed in the earliest stages (Slatnik & Duff, 2015).

Risk Factors

Several factors may increase a woman's risk for ovarian cancer. Both modifiable and non-modifiable factors have been found to increase the risk of ovarian cancer. Factors include family history, genetics, increasing age, reproductive history, use of hormones, and lifestyle choices (Carlson, 2016; Chen & Berek, 2016; Rooth, 2013).

Family history is the strongest risk factor for the development of ovarian cancer (Carlson, 2016). A positive family history of ovarian cancer is present in about 10-15% of women who develop ovarian cancer. Risk increases in the instance of a sporadic case of ovarian cancer, but risk is significantly greater when a hereditary cancer syndrome (breast-ovarian cancer syndrome or Lynch II syndrome) is present (Carlson, 2016). About 5-15% of ovarian cancers occur in women with breast cancer 1 (BRCA1) and breast cancer 2 (BRCA2) tumor suppressor gene mutations (Rooth, 2013). Women with a BRCA1 mutation, have a 35-45% lifetime absolute risk of developing ovarian cancer. A BRCA2 mutation carries a 15-25% risk (Carlson, 2016).

As mentioned earlier, ovarian cancer risk increases with age. Over half of ovarian cancers are diagnosed in women over 65 years. The average age of women at diagnosis of ovarian cancer is 63 years (Crull et al., 2014). Ovarian cancer diagnosed at a later age decreases the likelihood that the cancer is linked to a gene mutation (Carlson, 2016).

Reproductive history is linked to ovarian cancer risk. Nulliparity, early menarche (before age 12), and late menopause (after age 50) increase risk of developing ovarian cancer (Chen &

Berek, 2016). Infertility, endometriosis, polycystic ovarian syndrome, and pelvic inflammatory disease also may increase ovarian cancer risk (Carlson, 2016; Chen & Berek, 2016; Crull et al., 2014; Rooth, 2013). Suppression of ovulation by pregnancy, breastfeeding, and oral contraceptive pill (OCP) use, appear to decrease a woman's risk (Carlson, 2016; Rooth, 2013). Use of oral contraceptives for five or more years has been associated with a 50% risk reduction compared to those who have never used oral contraceptives. Researchers are uncertain whether those who carry the BRCA1 or BRCA2 mutations are included in the reduced risk with OCP use (Chura, 2015; Rooth, 2013).

Other factors that present varying degrees of increased risk for developing ovarian cancer include hormone replacement therapy (HRT), lifestyle factors, and ethnic background (Chen & Berek, 2016; Rooth, 2013). Researchers have concluded that long-term use of HRT increases risk of ovarian cancer; incidence is increased by one added occurrence of ovarian cancer per 2,500 users of HRT and mortality is increased by one extra death per 3,300 users of HRT (Chen & Berek, 2016; Million Women Study Collaborators, 2007; Rooth, 2013). Unopposed estrogen use after menopause may have a higher risk of ovarian cancer compared with estrogen-progestin therapy (Chen & Berek, 2016; Crull et al., 2014). A woman's lifestyle may lead to an increased risk of ovarian cancer. Lifestyle factors that increase risk include smoking, obesity, lack of exercise, high-fat diet, and perineal talcum powder use (Crull et al., 2014). Women of Ashkenazi Jewish, French Canadian, Dutch, and Icelandic descent may be genetically more susceptible (Slatnik & Duff, 2015).

Symptoms

Ovarian cancer was often referred to as a "silent disease" or a "silent killer" due to a lack of recognizable signs and symptoms of the disease (Goff et al., 2007). Researchers have since

verified that up to 95% of women report experiencing symptoms prior to their diagnosis of ovarian cancer (Goff et al., 2007). Symptoms of ovarian cancer are often subtle and nonspecific (Slatnik & Duff, 2015).

Gastrointestinal, urinary, and gynecological symptoms are the more common presenting complaints (Crull et al., 2014). Most often, symptoms are gastrointestinal in nature: abdominal distension, nausea, dyspepsia, early satiety, diarrhea, and constipation. Urinary frequency or urgency is also common (Chura, 2015). Other symptoms may include a recent unexplained increase in abdominal size, bloating, back or abdominal pain, loss of appetite, change in bowel habits (constipation or diarrhea), unexplained weight loss or gain, and suspected new diagnosis of irritable bowel syndrome (especially in those over age 50). Fatigue, pelvic pressure or pain, postmenopausal bleeding, menstrual irregularities, and rectal bleeding are other possible symptoms of ovarian cancer (Slatnik & Duff, 2015).

Screening Recommendations

The purpose of cancer screening is to detect malignancies and detect the cancer at an earlier stage. Ovarian cancer screening methods are pelvic examination, tumor biomarkers, ultrasonography, or combinations of these methods. Currently there are no clinical guidelines in North America that recommend screening for ovarian cancer in average risk women (AAFP, 2016b; ACOG, 2011; Doubeni et al., 2016; Moyer, 2012; NCCN, 2015; Qaseem et al., 2014; Wilt et al., 2015).

Screening for ovarian cancer also carries possible risks (Carlson, 2016). A false positive screening result may lead to unnecessary surgical procedures, increased potential complications, psychological effects, and financial costs (Carlson, 2016). A protocol for ovarian cancer screening should yield a positive predictive value (PPV) of at least 10%. To achieve a PPV of

greater than or equal to 10%, the screening protocol would need to have a sensitivity of at least 75% and a specificity of at least 99.6% (Carlson, 2016; Crull et al., 2014; Schorge et al., 2010).

For women of average risk, preventative guidelines in the U.S. do not recommend screening for ovarian cancer (Doubeni et al., 2016; Qaseem et al., 2014; Wilt et al., 2015). The U.S. Preventive Services Task Force (USPSTF) recommends against screening for ovarian cancer in asymptomatic women, a grade D recommendation. The USPSTF recommendation does not pertain to women with a known genetic mutation increasing their ovarian cancer risk (Moyer, 2012). The American College of Physicians (ACP) recommends against screening pelvic examinations in asymptomatic women of average risk (Qaseem et al., 2014). The Society of Gynecologic Oncology (SGO) recommends that asymptomatic women at low risk for ovarian cancer not be screened with cancer antigen-125 (CA-125) or ultrasound (Schorge et al., 2010).

Several expert groups recommend screening for ovarian cancer in specific populations of women. The National Comprehensive Cancer Network recommends high-risk women be offered screening with CA-125 measurement and transvaginal ultrasonography every six months (ACOG, 2011). The SGO recommends that high-risk women, those who are BRCA1 or BRCA2 mutation carriers, be screened with pelvic exam, CA-125, and transvaginal ultrasonography every six months starting at 35 years of age, or 5 to 10 years before the earliest age of first diagnosis of ovarian cancer in the family (Schorge et al., 2010). The American College of Obstetricians and Gynecologists (ACOG) recommends, for those with a BRCA mutation, beginning transvaginal ultrasonography and CA-125 screening between 30 and 35 years of age or 5 to 10 years before the earliest age of ovarian cancer diagnosed in the family (ACOG, 2009).

Researchers who conducted the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (Buys et al., 2011) and the United Kingdom Collaborative Trial of Ovarian Cancer

Screening (Jacobs et al., 2016) examined the impact of screening methods on ovarian cancer mortality. Buys et al. (2011) studied over 68,000 women between 55-74 years of age in the U.S. The women were randomized into two groups: annual screening with CA-125 and transvaginal ultrasound or usual care. In the screening group, there were 118 ovarian cancer deaths compared to 100 deaths from ovarian cancer in the usual care group. Overall mortality was not reduced by routine screening (Buys et al., 2011). Jacobs et al. (2016) studied 202,638 postmenopausal women in the United Kingdom (U.K.) over a period of 11 years. The women were randomly assigned to one of three groups: no screening, annual screening with transvaginal ultrasound, or multimodal screening with CA-125 and a risk of ovarian cancer algorithm (ROCA). The ROCA assigned women to normal (annual CA-125 screening), intermediate (CA-125 testing repeated in 3 months), and elevated (CA-125 testing repeated in 6 weeks and transvaginal ultrasound) categories based upon risk. There was a 15% reduction in mortality in the multimodal screening group and an 11% reduction in the ultrasound group. The two-stage screening approach (CA-125 and ROCA) had a specificity of 99.9% and positive predictive value of 40% for identifying invasive ovarian cancer (Jacobs et al., 2016). The main difference between the two studies is the use of CA-125 with one cut-off value versus a two-stage approach with the ROCA (Siwek, 2016).

Diagnosis

Since over 70% of women are diagnosed in later stages of the disease, ovarian cancer is considered one of the deadliest gynecologic cancers (Slatnik & Duff, 2015). An early diagnosis is often related to a more favorable outcome. Five-year survival rate of stage I ovarian cancer is 90% compared to the 6% survival rate of stage IV (Slatnik & Duff, 2015). Many methods are

available to detect ovarian cancer: symptom index, pelvic examination, tumor biomarkers, and ultrasound (Crull et al., 2014; Doubeni et al., 2016; Rooth, 2013).

Symptom Index

Goff et al. (2007) created an ovarian cancer symptom index to help clinicians identify women with ovarian cancer. Pelvic pain, abdominal pain, bloating, increased abdominal girth, difficulty eating, and early satiety make up the symptom index. The index is considered positive if any of the six symptoms occur more than 12 times per month over a period of less than 12 months. In early-stage disease, the symptom index has a sensitivity of 56.7% and 79.5% for advanced-stage disease. Specificity of the symptom index in women less than 50 years of age was 86.7% and 90% in women greater than 50 years of age (Goff et al., 2007).

Pelvic Examination

Ovarian tumors can be detected during routine bimanual pelvic examination. During a pelvic examination, the ovaries are palpated for size, shape, and consistency (ACS, 2014). Due to the location of the ovary, early stage tumors are not often found. Tumors detected by palpation are usually in advanced stages (Carlson, 2016).

Tumor Biomarkers

Over 200 possible tumor biomarkers have been identified for ovarian cancer (Rooth, 2013). A biomarker is a biological molecule found within the body that is an indicator of a normal or abnormal process. Tumor biomarker levels rise in response to tissue damage caused by a proliferating tumor. CA-125 and human epididymis protein 4 (HE4) are two biomarkers that are used to assess for ovarian cancer (Rooth, 2013).

CA-125 is a tumor biomarker used to detect ovarian cancer, rising in the presence of tissue damage. The level can also be elevated in other diagnoses such as endometriosis, uterine

leiomyoma, cirrhosis, pelvic inflammatory disease, pleural or peritoneal fluid, or cancers of the lung, breast, endometrium, and pancreas (Carlson, 2016; Rooth, 2013). CA-125 levels can differ with age, ethnicity, and smoking status. For example, levels are lower in non-whites and in current smokers; levels increase with age. The normal value of CA-125 is less than or equal to 35 IU/ml (Rooth, 2013). In early stages of ovarian cancer, CA-125 levels are elevated in about 50% of cases. Levels are elevated in over 80% of cases of advanced disease. Assessing change in CA-125 levels over time may be more reliable (Carlson, 2016). Elevated CA-125 levels warrant further investigation.

HE4 is another biomarker for ovarian cancer, with similar sensitivity as CA-125. HE4 is less likely than CA-125 to be elevated in benign disease (Carlson, 2016). In the U.S., HE4 is used for disease recurrence and progression, not screening (Carlson, 2016; Doubeni et al., 2016; Slatnik & Duff, 2015).

Ultrasound

Transvaginal ultrasonography is a method used to detect ovarian cancer. The size of ovaries and morphologic characteristics can be visualized (Carlson, 2016). The sensitivity for differentiating benign and malignant lesions is 86 to 94%. Specificity ranges from 94 to 96% (Doubeni et al., 2016).

Healthcare Professionals' Knowledge of Ovarian Cancer

Among healthcare professionals, there are large gaps in knowledge regarding ovarian cancer (Gajjar, Ogden, Mujahid, & Razvi, 2012). Information from nurses, NP students, and practicing healthcare providers regarding their knowledge about ovarian cancer has been obtained through several research studies. Two different groups of researchers, Gajjar et al. (2012) and Goldstein, Susman, Lockwood, Medlin, and Behbakht (2015) assessed healthcare

providers' awareness about symptoms and risk factors of ovarian cancer. Loerzel, Hunt, and Rash (2015) assessed NP students' knowledge prior to, immediately after, and approximately five months after ovarian cancer education.

From 2008-2009, Gajjar et al. (2012) studied responses of 110 general practitioners (GP) in the U.K. about their awareness of symptoms and risk factors of ovarian cancer. GPs answered questions on symptoms, diagnosis, and risk factors. Very few GP respondents (6.4%) indicated that women had symptoms in the early stages of ovarian cancer. More than half of GPs correctly responded that early diagnosis of ovarian cancer is possible. Of the GPs who participated, 26.4% indicated that women with the disease are more likely to experience symptoms that are very frequent, persistent, and sudden. When asked about symptom frequency, 19.8% of respondents correctly identified that symptoms are often experienced 12-30 times per month. Regarding the importance of a family history, 96.4% of respondents knew that a family history of ovarian cancer increased a woman's risk although only 80.9% knew that a family history of breast cancer is a risk factor. Symptoms of abdominal swelling, abdominal bloating, and pelvic pain were identified among respondents as relevant symptoms of ovarian cancer. Respondents did not assign as much significance to gastrointestinal symptoms such as altered bowel habit, indigestion, and early satiety. Gajjar et al. (2012) found that among the GPs studied, a gap in knowledge exists about the symptoms of ovarian cancer. Study participants were more knowledgeable about the importance of a family history of ovarian cancer and less knowledgeable about the significance of family history of breast cancer. Gajjar et al. (2012) concluded that awareness about risk factors and symptoms of ovarian cancer needs to be increased among GPs and regular updates are important to remain current with research.

Goldstein et al. (2015) researched U.S. healthcare providers' awareness of symptoms and risk factors of ovarian cancer at a health fair in 2013. One hundred and eighty-eight healthcare providers (family practice physicians, nurses, NPs, and obstetricians/gynecologists) completed the survey. Participants answered questions to identify symptoms and risk factors pertinent to ovarian cancer. Goldstein et al. (2015) found that symptom recognition among healthcare providers ranged from 62-90%. Only 62% of healthcare providers could identify difficulty eating/early satiety and pelvic/abdominal pain as symptoms of ovarian cancer. Out of providers who participated, 90% were able to identify bloating and pelvic/abdominal swelling as a symptom. The symptom of urinary frequency/urgency was correctly recognized by 65% of healthcare providers. Unexplained changes in bowel habits and vague/persistent stomach discomfort (gas, nausea, indigestion) were identified as symptoms by 72% and 79%, respectively. Regarding identification of risk factors of ovarian cancer, 90% of providers were able to identify that a personal or family history of breast, ovarian, or colon cancer is a risk factor. Only 41% recognized that undesired infertility is a risk factor. Obesity, increasing age, and genetic predisposition were correctly identified 61%, 70%, and 83% of the time, respectively. The number of healthcare providers who believed that an abnormal Papanicolaou (Pap) test is an indicator of ovarian cancer was 32%. Healthcare providers were not able to identify all symptoms and risk factors of ovarian cancer. Goldstein et al. (2015) concluded that healthcare providers need education about symptoms of ovarian cancer.

A study by Loerzel et al. (2015) assessed 104 NP students' knowledge of ovarian cancer incidence, risk, screening, symptoms, and treatment. A pretest was administered to assess baseline knowledge. Education on ovarian cancer was presented to students. A posttest was administered immediately after the education. Another posttest was given the following

semester, about five months later. NP students' scores from the pretest to the first posttest increased and then decreased by the second posttest. NP students' scores on the second posttest were still significantly higher than on the pretest. The researchers concluded that NP students lacked knowledge about ovarian cancer risk factors, symptomology, and screening. Knowledge gained after an educational session decreases over time, pointing to the importance of continuing education (Loerzel et al., 2015).

Women's Knowledge of Ovarian Cancer

Even larger gaps in knowledge about ovarian cancer exist among women (Goldstein et al., 2015). Two different groups of researchers, Lockwood-Rayermann, Donovan, Rambo, and Kuo (2009) and Goldstein et al. (2015) assessed women's knowledge of ovarian cancer. Similar results were reported.

Lockwood-Rayermann et al. (2009) discovered that among women, a knowledge deficit exists in regards to ovarian cancer risk factors and symptoms. Researchers surveyed women 40 years of age and older about ovarian cancer risk factors, symptoms, and diagnosis. Of 1,235 respondents, only 15% reported being "familiar" or "very familiar" with ovarian cancer symptoms compared to 59% who reported being "not very familiar" or "not familiar at all." Less than half of respondents could recognize symptoms of ovarian cancer from a list provided. One question was related to the Pap test diagnosing ovarian cancer. More than two-thirds of respondents believed that a Pap test could diagnose ovarian cancer. Knowledge about risk factors linked to ovarian cancer was also lacking. More than one-third of respondents reported that they were not sure about risk factors. Researchers concluded women 40 years of age and older need to be better informed about ovarian cancer. Nurses may be able to provide education

and, therefore, have an impact on early detection of ovarian cancer (Lockwood-Rayermann et al., 2009).

At the same health fair where researchers assessed healthcare providers' knowledge about ovarian cancer, Goldstein et al. (2015) also researched women's awareness of symptoms and risk factors of ovarian cancer. Eight hundred and fifty-seven women completed the survey about symptoms and risk factors related to ovarian cancer. Recognition of symptoms ranged from 23-72%. Only 23% of respondents were able to identify urinary frequency or urgency as a symptom of ovarian cancer. Of the women who participated, 72% were able to identify bloating and pelvic/abdominal swelling as a symptom. Regarding identification of risk factors associated with ovarian cancer, risk factor identification ranged from 25-82%. The number of participants who incorrectly believed that an abnormal Pap test is an indicator of ovarian cancer was 57%. Women were not able to identify all of the listed symptoms and risk factors related to ovarian cancer (Goldstein et al., 2015).

Continuing Education

Continuing education (CE) dates back to 1894 when Florence Nightingale promoted continued learning in nurses (Institute of Medicine, 2010). Many healthcare professionals are required to complete CE to meet the requirements of their licensing and certifying agencies (Forsetlund et al., 2009). The assumption has always been that CE improves healthcare. Cervero and Gaines (2015) found that CE improves physician performance and, to a smaller degree, patient health outcomes. Moattari, Yadgari, and Hoseini (2014) concluded that knowledge could increase through participation in CE. Smith, Brown, and Khanna (2009) concluded that the frequency of healthcare professionals' attendance at educational meetings coincided with the likelihood they were to implement the desired behaviors. The American

College of Chest Physicians (ACCP) recommends that CE be used to improve practice performance of physicians (Davis & Galbraith, 2009). The ACCP recommends that printed materials should not be the only method used; instead it is recommended that both live and multiple media should be utilized to improve practice performance. The ACCP also recommends that to improve practice performance, CE activities should be comprised of more than just a single exposure (Davis & Galbraith, 2009).

A variety of educational methods can be used to present information. Methods can include conferences, workshops, courses, grand rounds and teaching, journals clubs, and self-learning with print or internet-based materials. An educational method that is interactive is the most effective method to improve healthcare professional performance and patient outcomes (Cervero & Gaines, 2015).

Project Framework

A theoretical framework and/or model should guide a practice improvement project. Models aid in planning and evaluating projects. A logic model visually shows the relationships between resources (inputs), processes (activities), and products (outputs) that lead to desired results (outcomes) and impacts (Erwin et al., 2016; Melle, 2016; W. K. Kellogg Foundation, 2004). A logic model was chosen to guide the project. Kirkpatrick's four-level outcome evaluation model addresses four levels: reaction, learning, behavior, and results (Tian, Atkinson, Portnoy, & Lowitt, 2010). An adapted version of Kirkpatrick's four-level outcome evaluation model guided evaluation of the project.

Logic Model

A logic model is a tool that can be used for program planning and evaluation (McCawley, 2014). The model is comprised of inputs, activities, outputs, outcomes, and impacts. Inputs and

activities are the planned work while outputs, outcomes, and impacts are the intended results (Erwin et al., 2016; Melle, 2016; W. K. Kellogg Foundation, 2004). The model allows for visualization of the relationships between resources, activities, and results (W. K. Kellogg Foundation, 2004).

Kirkpatrick's Evaluation Model

Reaction, learning, behavior, and results are the major components of the four levels of Kirkpatrick's Evaluation Model (Tian et al., 2010). Curran and Fleet (2005) modified Kirkpatrick's model to be used for evaluating CE. The modified levels are learner satisfaction, learning outcomes, performance improvement, and improved patient/health outcomes (Curran & Fleet, 2005). Evaluation starts with level one (learner satisfaction) and with time evaluation is able to move through the other three levels (Tian et al., 2010).

Conclusion

Ovarian cancer's vague symptoms and lack of accurate and reliable screening tests contribute to a late diagnosis, which lowers the five-year survival rate (Doubeni et al., 2016). Healthcare professionals lack knowledge about ovarian cancer's risk factors and symptoms (Gajjar et al., 2012). The lack of knowledge points to the need for ovarian cancer education of healthcare professionals. Continuing education has resulted in improvements in healthcare professionals' knowledge, practice performance, and patient health outcomes (Cervero & Gaines, 2015; Moattari et al., 2014). Chapter 3 will discuss the project's mission, design, protection of human subjects, and data collection.

CHAPTER THREE. PROJECT DESIGN

Mission

The project originated due to a request from the husband of a former nursing student who succumbed to ovarian cancer. After his wife's death, Brent Solseng, PharmD, began a personal mission to increase ovarian cancer awareness. Dr. Solseng founded the Pam Solseng Ovarian Cancer Endowment Fund through Dakota Medical Foundation:

The Pam Solseng Ovarian Cancer Endowment Fund was established in 2010 in memory of Pam Solseng who died after a courageous battle with ovarian cancer. This fund supports health-related projects and programs within Dakota Medical Foundation's service area, with a special emphasis on nursing and pharmacy education and ovarian cancer programs. (Impact Foundation, 2016)

Since the beginning of project planning, Dr. Solseng has been involved in brainstorming about how best to increase healthcare professional awareness and knowledge. The decision was to present ovarian cancer research, risk factors, symptoms, screening, diagnosis, and treatment to healthcare professionals at a local educational conference.

Design

The focus of the project was to increase healthcare professionals' knowledge about ovarian cancer through an educational conference. The conference focused on presenting the risk factors and symptoms of ovarian cancer, areas found to be lacking in healthcare professionals' knowledge (Gajjar et al., 2012; Goldstein et al., 2015; Loerzel et al., 2015). The conference took place on the evening of Tuesday, November 22, 2016, and was approximately two hours in length. The target audience was healthcare professionals, and it was expected that attendees might have included physicians, NPs, physician assistants, nurse midwives, nurses,

pharmacists, nursing students, and pharmacy students. The conference was planned for an attendance of 50-100 people and was offered at no cost to attendees. A logic model was used during the planning phase of the project to provide a visualization of the relationship between planned activities and results.

Logic Model

A logic model (Figure 1) was created for project planning. The planned work defined what resources were needed for the project and what was proposed to take place. Inputs and activities were used in the planning phase of the project. The planning phase is outlined in the bold section of Figure 1.

Inputs are the resources needed for the project (W. K. Kellogg Foundation, 2004). They enable successful execution of the project. The project required many inputs: personnel, time, finances, venue, equipment, and advertising.

Personnel consisted of committee members, an emcee, a presenter, a survivor/caregiver panel, and conference assistants. Committee members contributed ideas and expertise during conference planning. The co-investigator was emcee. Dr. Anil Potti, a medical oncologist, was the primary presenter. His experience is treating patients with ovarian cancer and conducting ovarian cancer research. A panel consisting of one ovarian cancer survivor and three family members of ovarian cancer patients spoke about their personal experiences with the disease. Conference assistants helped register attendees, serve food, set up technology, and clean up after the event.

Projects require time. A considerable amount of time was required for the planning and execution of the conference. Committee members, the presenter, survivor/caregiver panel members, and conference assistants dedicated their time.

Funding for the project was provided through the Pam Solseng Ovarian Cancer Endowment Fund. Costs for the project included printed materials, food, and supplies used during the conference. Dr. Potti graciously donated his time. Dakota Medical Foundation allowed use of their event center at no cost.

A venue for the conference was sought based upon location, size, available equipment, and costs. Dakota Medical Foundation's event center was chosen as the site to host the conference. The event center can hold up to 120-150 people and had the necessary equipment to put on an educational conference.

Dakota Medical Foundation supplied the equipment (projector, projector screens, and microphones) for the conference. A laptop was brought into the facility to display the PowerPoint presentation. A video camera was provided by North Dakota State University's (NDSU) Instructional Services Department to allow for recording of the conference.

Advertising for an event is important to gain attendance. An announcement was designed (Appendix B) and an event for registration of attendees was created through the website Eventbrite. The conference was advertised with advanced practice providers on Sanford's Advanced Practice Provider SharePoint site, within Sanford's Roger Maris Cancer Center, and on the North Dakota Nurse Practitioner Association's Facebook site. Advertising for the event was also done within the College of Health Professions at NDSU.

Inputs are used to carry out the planned activity (W. K. Kellogg Foundation, 2004). One of the project's activities included presenting an ovarian cancer conference directed towards healthcare professionals. The second activity was to provide a resource for patient education.

The ovarian cancer presentation was created by Dr. Potti. Information provided during the conference was evidence-based and focused on areas in which healthcare professionals

lacked knowledge: risk factors and symptoms (Gajjar et al., 2012; Goldstein et al., 2015; Loerzel et al., 2015). Other information presented included the different types of ovarian cancer, factors that reduce a woman's risk, screening options, staging, and treatment. The co-investigator reviewed the PowerPoint before the presentation to evaluate content and assure it was at a level appropriate for the audience. Refer to Appendix D for an outline of the presentation.

Since researchers found that women are not well informed about ovarian cancer, a patient resource was created. Information included on the patient resource was evidence-based and focused on risk factors and symptoms, since women specifically lack knowledge in those areas (Lockwood-Rayermann et al., 2009; Goldstein et al., 2015). Statistics for ovarian cancer were presented to convey importance of awareness and knowledge about the disease. Eye-catching graphics were displayed to attract the reader's attention. Reputable resources were provided for a patient to reference. The information was printed in teal and black colored ink on 4.25 x 5.5 inch paper. Refer to Appendix I for the patient resource handout.

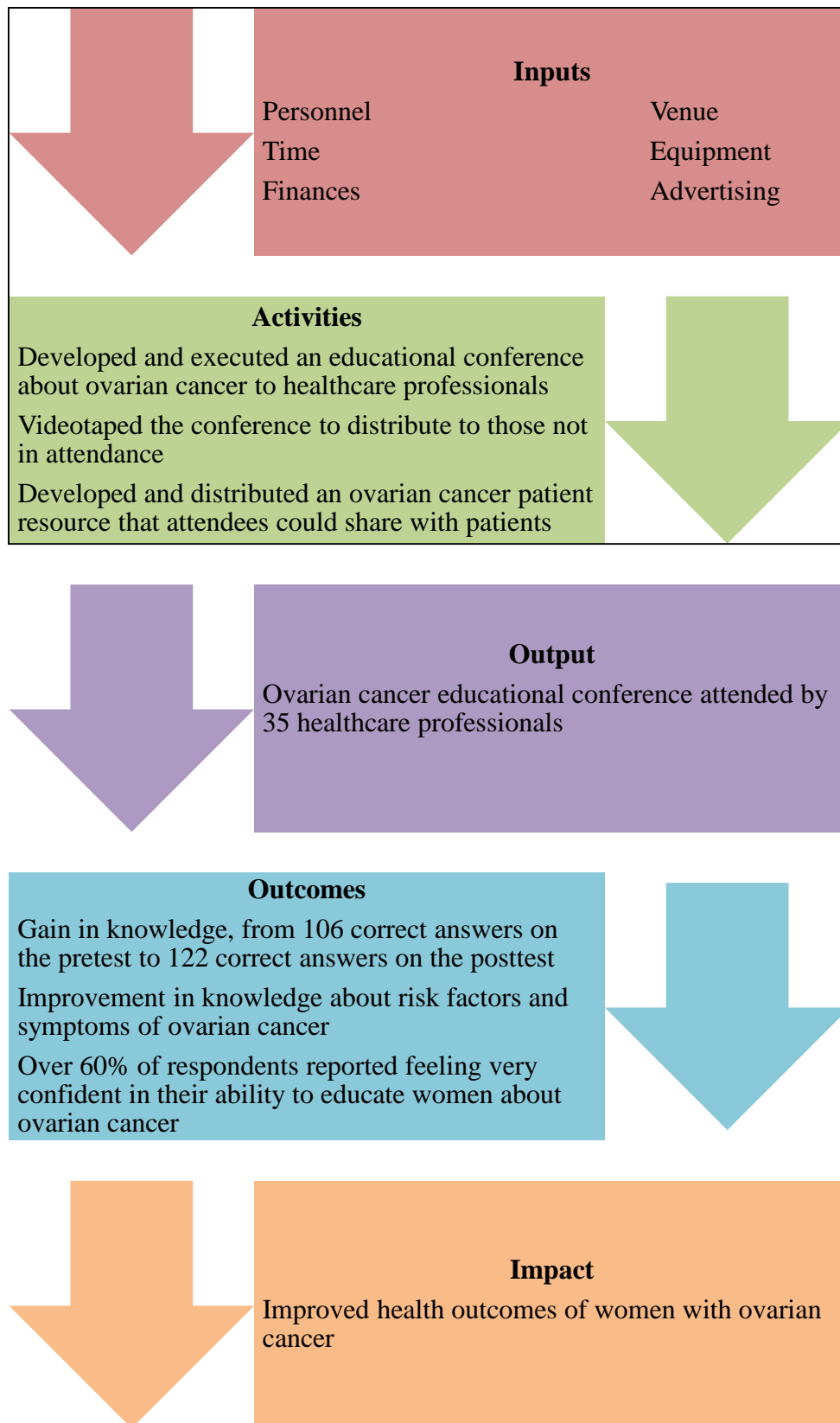


Figure 1. Logic model inputs and activities

Institutional Review Board Approval

The practice improvement project was certified as exempt by the NDSU Institutional Review Board on October 27, 2016 (Appendix A). Research focused on the effectiveness of an instructional technique. The project qualified under Exemption Category 1: research conducted in established or commonly accepted educational settings, involving normal educational practices. The educational conference did not involve minors and did not specifically recruit for special populations (pregnant women, fetuses, prisoners, cognitively impaired individuals, economically or educationally disadvantaged individuals). Attendance and participation at the conference was voluntary. There was minimal risk to respondents. The conference was videotaped but not for research purposes. A photograph and video release form (Appendix J) was signed by the presenter and each panel speaker.

Data Collection

In order to assess the effectiveness of an ovarian educational conference for healthcare professionals, pretests, posttests, and conference evaluations were administered. Data was collected the evening of November 22, 2016. Conference attendees were informed of the opportunity to voluntarily participate in the research portion of the project and participation implied consent (Appendix C). Those who responded completed a pretest, posttest, and conference evaluation. Prior to the start of the lecture, respondents were asked to complete the pretest (Appendix E) and participant demographic survey (Appendix F). Upon conclusion of the conference, respondents were asked to complete the posttest (Appendix G) and conference evaluation (Appendix H).

CHAPTER FOUR. EVALUATION

Evaluation Methods

Evaluation of the project involved assessing whether objectives were met. Evaluation of the conference and education presented at the conference was measured through a pretest, posttest, and conference evaluation survey.

Objective One

The first objective was to design, organize, and offer a local ovarian cancer educational conference for healthcare professionals. Conference planning and evaluation was guided by a logic model.

Objective Two

Objective two was to increase awareness and knowledge about ovarian cancer among healthcare professionals. Education about ovarian cancer risk factors and symptoms were delivered during the conference. Evaluation was completed through analysis of pretest and posttest results which assessed the respondents' level of knowledge gained.

Objective Three

The third objective was to provide healthcare professionals with a resource for patient education. An ovarian cancer resource was created for healthcare professionals to share with patients. Content was created utilizing current evidence-based data and focused on risk factors and symptoms of ovarian cancer. Evaluation of objective three was accomplished through the question "After this conference, how confident are you in your ability to educate women about ovarian cancer?"

Logic Model

Outputs are the result of activities (W. K. Kellogg Foundation, 2004). An output of the conference was the delivery of awareness and knowledge about ovarian cancer. The aim of the conference was to increase awareness and knowledge among healthcare professionals. The goal of the patient resource was to increase women's awareness and knowledge about ovarian cancer.

Outcomes are the changes that result from the program (W. K. Kellogg Foundation, 2004). The expected outcomes of the conference included an increase in awareness of ovarian cancer, knowledge of ovarian cancer risk factors and symptoms, and recommendations for future ovarian cancer educational programs.

Impacts are the changes that are expected at the organizational, community, or system level as a result of activities (W. K. Kellogg, 2004). The conference was expected to have a community impact. Through increasing healthcare professional awareness and knowledge of ovarian cancer, the expectation is that an improvement of health outcomes of women will result.

Kirkpatrick's Evaluation Model

The project was also evaluated by using the modified version of Kirkpatrick's Evaluation Model. For the first level, learner satisfaction, a conference evaluation survey was used to evaluate respondents' perceptions of the conference. Respondents were asked to evaluate the presenter, presentation, content, and panel. The second level is learning outcomes. An evaluation of knowledge learned assisted in determining conference effectiveness. Analysis of pretests and posttests was used to gauge knowledge. The third level is an evaluation of how the education has affected the performance of the healthcare professional. The fourth, and final, level evaluates the patient outcomes because of the education (Curran & Fleet, 2005). The third

and fourth levels of the modified version of Kirkpatrick's model were not evaluated in the time frame of the project.

CHAPTER FIVE. RESULTS

Presentation of Findings

Data was collected during the ovarian cancer conference which took place the evening of November 22, 2016. The conference was attended by 35 healthcare professionals and seven other individuals, which included a speaker, panel speakers, and family members and friends of panel speakers. There were 29 respondents who fully completed the pretest, posttest, and conference evaluation.

Demographics

Respondents were asked to provide demographic information regarding primary professional role (Appendix F). The majority of respondents were undergraduate nursing students ($n=15$). Other respondents included graduate nursing students ($n=3$), registered nurses ($n=4$), pharmacy students ($n=4$), and pharmacists ($n=2$). The professional background of one respondent was not defined. Figure 2 provides the breakdown of the primary professional role of respondents.

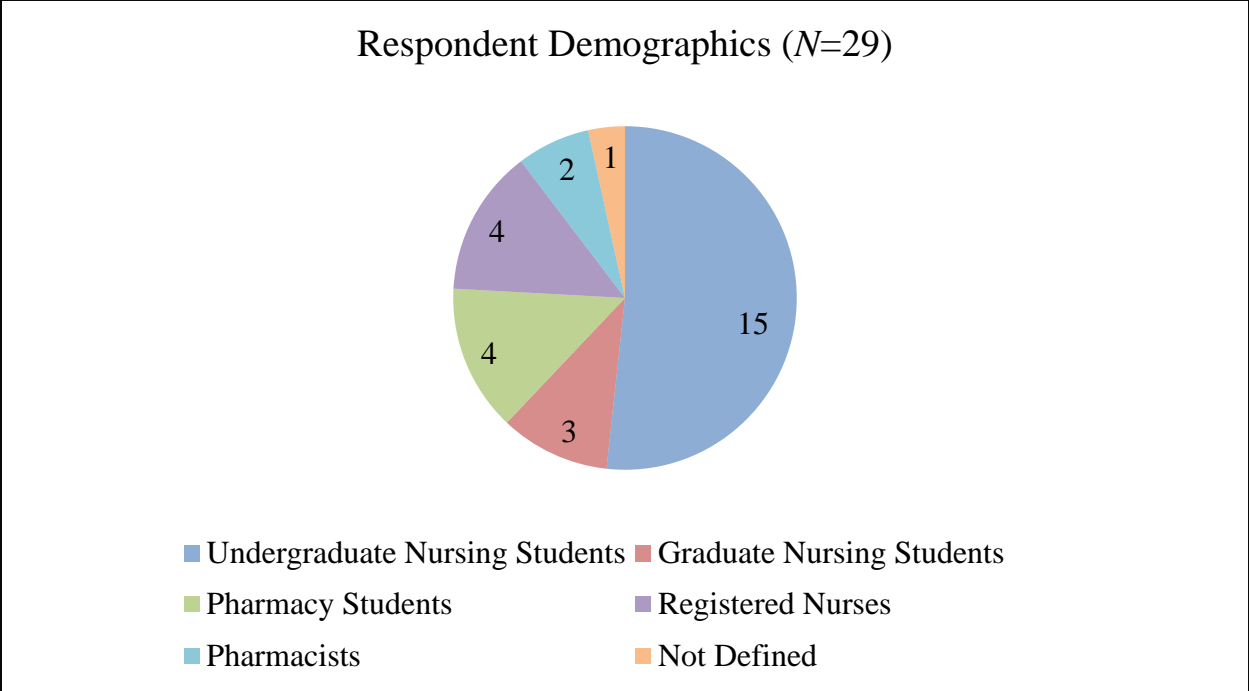


Figure 2. Respondent demographics

Pretests and Posttests

Respondents were asked to complete the pretest prior to the start of the speaker’s presentation. After the speaker’s presentation and the panel presentation, respondents were asked to complete the posttest. A full set of questions on the pretest and posttest can be referred to in Appendix E and Appendix G. Results of the pretest and posttest were compared and summarized in Figure 3.

The first question on the pretest and posttest related to ovarian cancer mortality. Before the conference, 100% (n=29) of respondents correctly answered the question. Approximately 93% (n=27) of respondents correctly answered the question after the conference.

The second question related to ovarian cancer screening. Prior to the conference, approximately 66% (n=19) of respondents correctly identified that screening for ovarian cancer is not recommended in women of average-risk. The percentage decreased to approximately 59% (n=17) after the conference.

The third question related to early symptoms of ovarian cancer. Approximately 76% ($n=22$) of respondents answered the question correctly on the pretest. After the conference, approximately 93% ($n=27$) of respondents chose the correct response.

The fourth question related to risk factors for the development of ovarian cancer. Prior to the conference, approximately 28% ($n=8$) of respondents answered the question correctly. Approximately 79% ($n=23$) of respondents correctly answered the question after receiving education during the conference.

The last question on the pretest and posttest related to the examination and testing for ovarian cancer. Approximately 97% ($n=28$) of respondents correctly answered the question on the pretest and posttest. Knowledge remained the same before and after education presented at the conference.

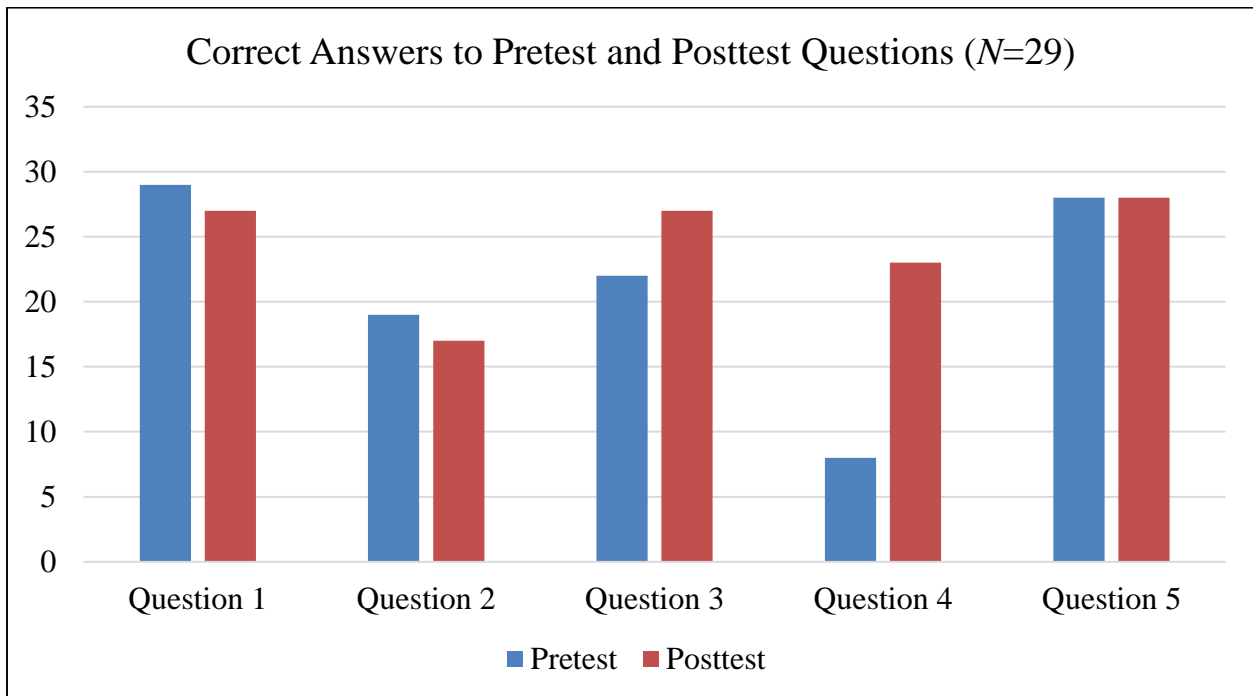


Figure 3. Correct answers to pretest and posttest questions

Conference Evaluation

Respondents were asked to evaluate several aspects of the conference (Appendix H). The presenter, Dr. Potti, was rated on enthusiasm, interaction with the audience, and knowledge of the topic. Figure 4 depicts the responses. Twenty-one respondents rated his enthusiasm as “excellent,” seven respondents rated his enthusiasm as “very good,” and one respondent rated his enthusiasm as “good.” As for the presenter’s interaction with audience, 21 respondents rated his interaction as “excellent,” seven respondents rated it as “very good,” and one respondent rated his interaction as “needs work.” Twenty-six respondents rated his knowledge as “excellent” and three rated his knowledge as “very good.”

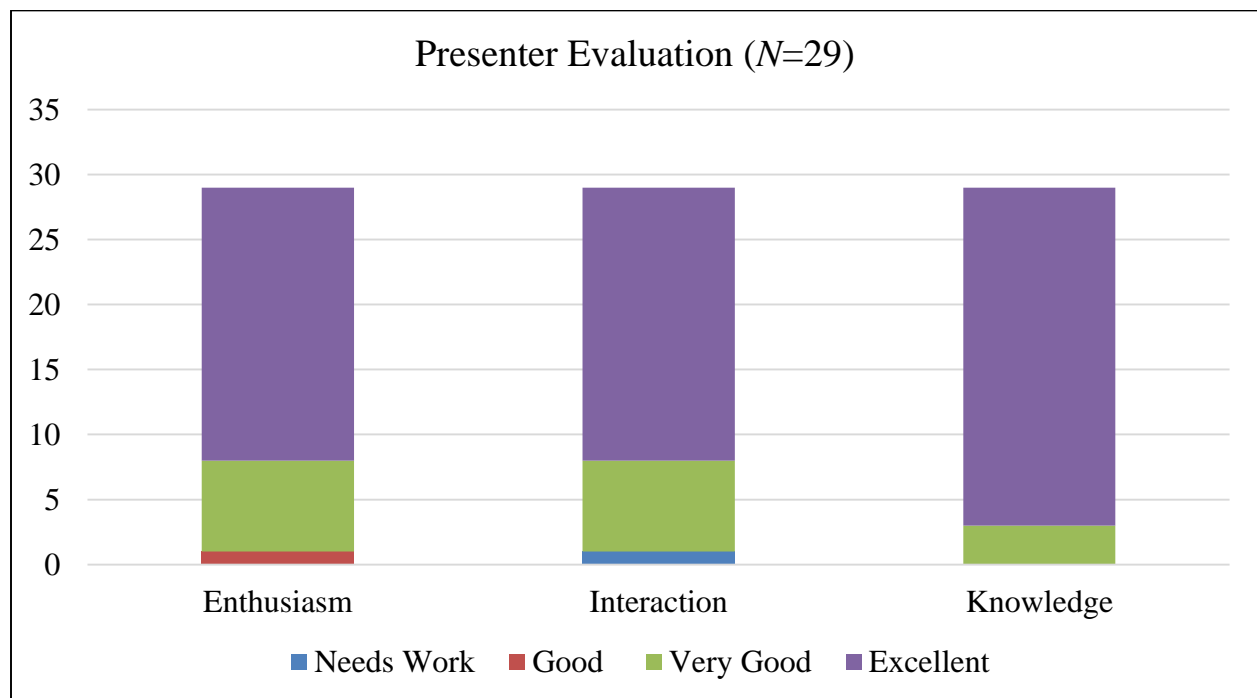


Figure 4. Presenter evaluation

The presentation was rated on organization, relative information, and quality of audiovisual material. Responses are depicted in Figure 5. Twenty-four respondents rated the organization as “excellent” and five respondents rated it as “very good.” Twenty-two respondents rated how much the information was related to practical problems as “excellent,”

five respondents rated it as “very good,” and two respondents rated it as “good.” Twenty respondents rated the quality of the audiovisual as “excellent,” six respondents rated it as “very good,” two rated it as “good,” and one respondent rated it as “needs work.”

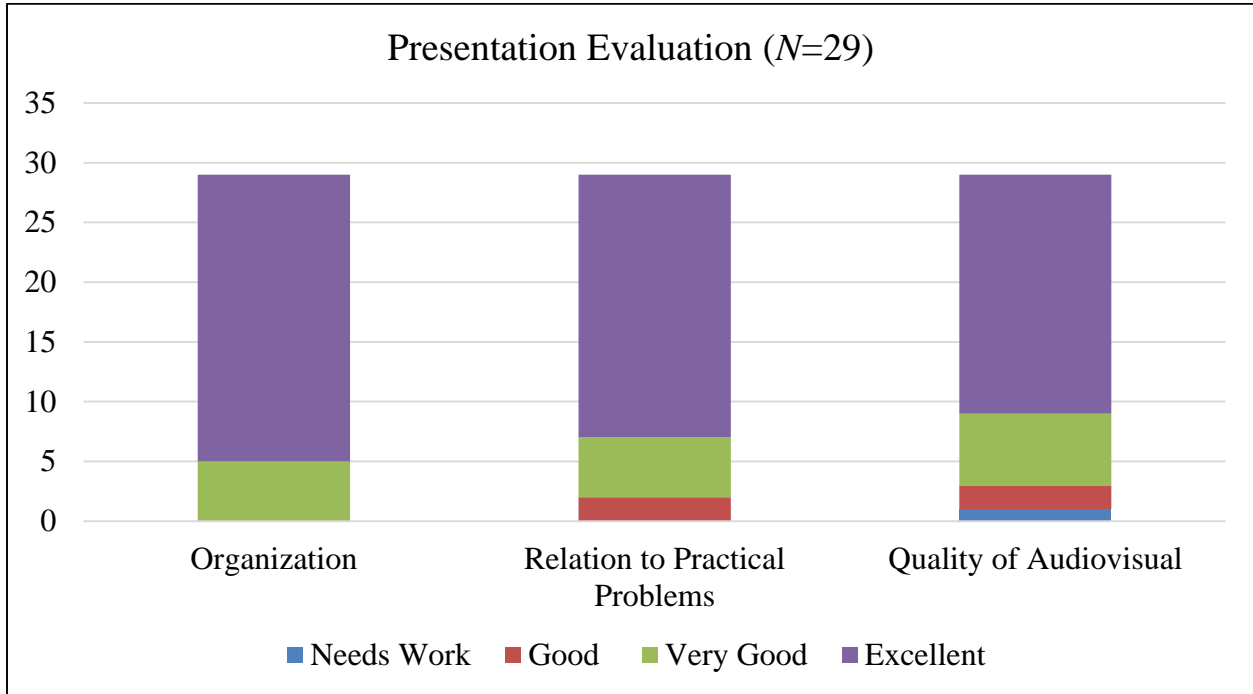


Figure 5. Presentation evaluation

The conference content was rated on the appropriateness of the volume and complexity of the information, evidence-based content, and content relevancy to practice. Figure 6 depicts the responses. Twenty-three respondents rated the volume and complexity of information as “excellent,” five respondents rated it as “very good,” and one respondent rated it as “good.” When rating the evidence-based content, 24 respondents rated it as “excellent,” four respondents rated it as “very good,” and one respondent rated it as “good.” Twenty-four rated the relevance to practice as “excellent,” four respondents rated it as “very good,” and one respondent rated it as “good.”

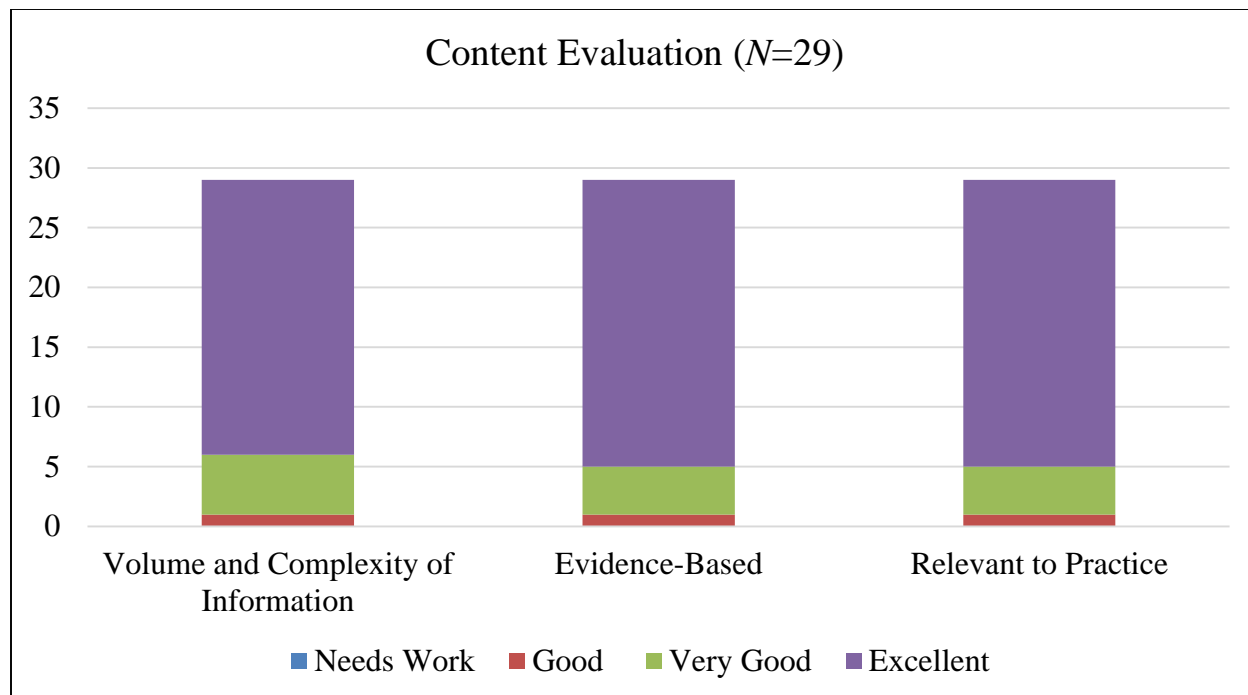


Figure 6. Content evaluation

Conference respondents were asked to rate the extent to which the panel’s discussion contributed to their overall learning. Twenty-one respondents rated the panel “excellent” and eight respondents rated the panel “very good” (Figure 7). Respondents were also asked, “How confident are you in your ability to educate women about ovarian cancer?” Eighteen reported they were “very confident” and 11 reported they were “somewhat confident” (Figure 8).

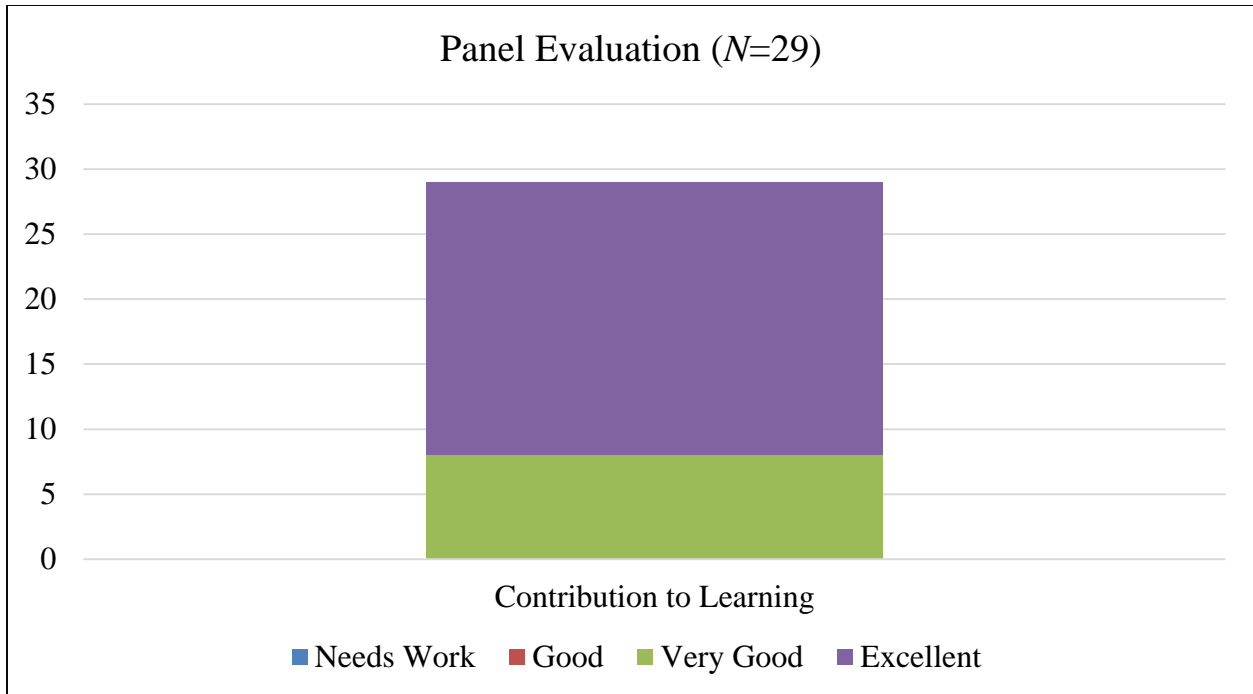


Figure 7. Panel evaluation

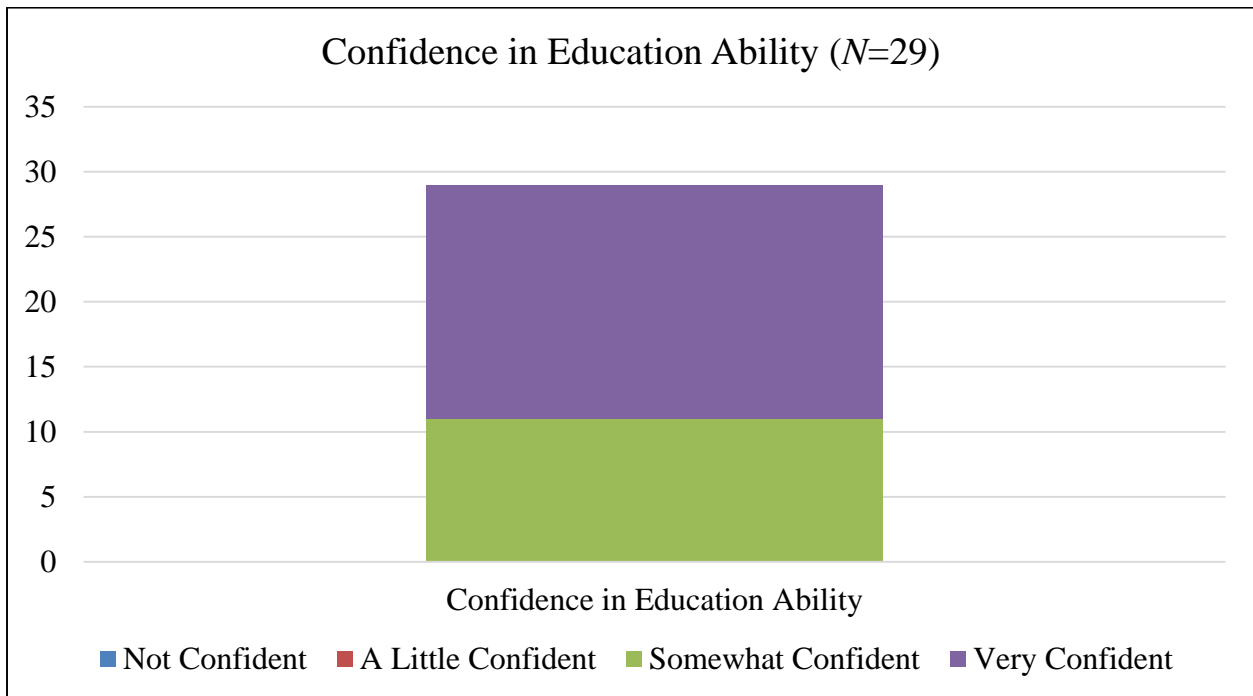


Figure 8. Confidence in education ability

This chapter presented the project's results. An interpretation of the project's results is provided in the next chapter. Project limitations, recommendations, implications for future research, and implications for advanced nursing practice will also be discussed in Chapter 6.

CHAPTER SIX. DISCUSSION AND RECOMMENDATIONS

The objectives of this project were to 1) design and organize a local ovarian cancer educational conference for healthcare professionals, 2) increase awareness and knowledge about ovarian cancer among regional healthcare professionals, and 3) provide healthcare professionals with a resource for patient education. This chapter offers an interpretation of conference results, project limitation, and recommendations. Also discussed are implications for practice, implications for future research, and application to NP role.

Interpretation of Results

All three objectives of the practice improvement project were achieved. The conference was successfully implemented and some gains in knowledge were observed. Overall, the ovarian cancer educational conference appeared to be an effective educational method for attendees.

Objective One

Conference evaluation was guided by a logic model. Evaluation included the conference outputs, outcomes, and impacts, outlined in the bold section of Figure 9. The conference was attended by 35 healthcare professionals. Respondents' correct responses increased on the posttest in the areas of ovarian cancer risk factor and symptom recognition. More than 60% of respondents reported feeling very confident in their ability to educate women about ovarian cancer. The impact of the conference is unknown in the time frame of this project. The hope is that through the conference there will be an improvement in health outcomes of women with ovarian cancer.

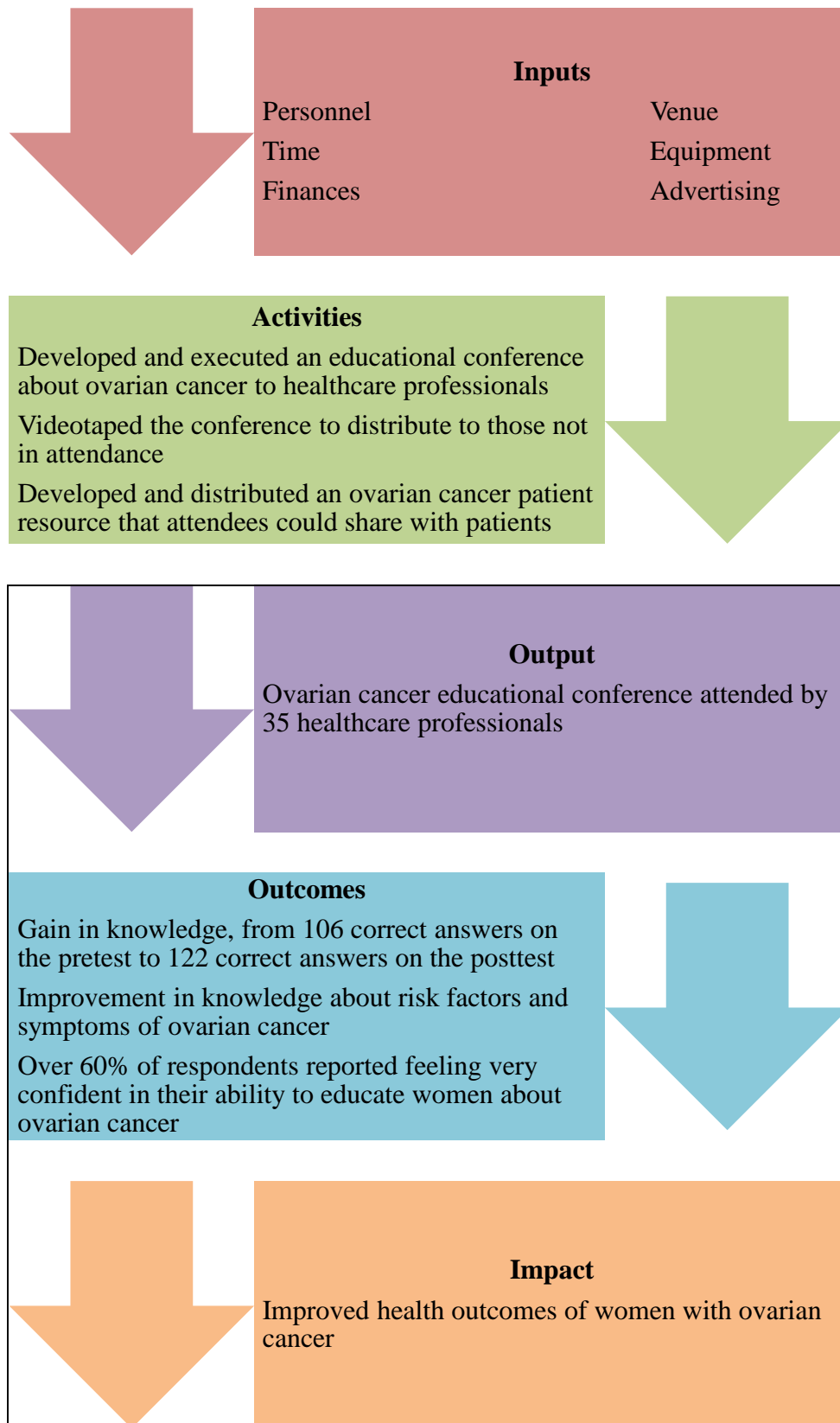


Figure 9. Logic model output, outcomes, and impact

Objective Two

The pretest and posttest assessed the speaker's and panel members' capability of increasing respondents' knowledge during the conference. When comparing answers to all questions, the number of correct responses increased from 106 on the pretest to 122 on the posttest. After the conference, there was an increase in correct responses on questions (Q) Q3 and Q4. There was a decrease in correct responses on Q1 and Q2. The number of correct responses stayed the same on Q5.

When comparing the pretest and posttest answers for Q1, there was a decrease in correct answers immediately after the educational PowerPoint presentation. On the pretest, 100% ($n=29$) of respondents answered the question correctly, leaving no room for improvement on the posttest. During the presentation, the speaker did not discuss that routine screening for ovarian cancer in women of average risk is not recommended which may account for the decrease in knowledge on the posttest.

Knowledge about ovarian cancer screening decreased immediately after the educational PowerPoint presentation. As stated previously, only approximately 59% ($n=17$) of respondents were aware that screening for ovarian cancer in women of average risk is not recommended. This could be due to the speaker not discussing screening recommendations during the presentation.

Prior to the educational conference, approximately 76% ($n=22$) of respondents were able to correctly identify symptoms of ovarian cancer. The results are consistent with Goldstein et al. (2015), who found that healthcare providers' knowledge of symptom recognition ranged from 62-90%. Knowledge increased and approximately 93% ($n=27$) of respondents were able to correctly identify symptoms after receiving education.

As mentioned in Chapter 5, respondents' knowledge about risk factors of ovarian cancer was very low prior to the conference. The results are consistent with research by Loerzel et al. (2015), who found that NP students' knowledge of ovarian cancer risk factors is lacking. The number of respondents who were able to identify factors that increase a woman's risk of developing ovarian cancer increased over 50%.

When comparing knowledge about exams and testing for ovarian cancer, knowledge remained the same on the pretest and posttest. There was little room for improvement as 28 respondents answered the question correctly on the pretest. A different respondent answered the question incorrectly on the posttest than on the pretest.

The results of the pretest and posttest may have been skewed by several factors. Undergraduate nursing students had recently heard Dr. Brent Solseng give a classroom lecture on ovarian cancer. Ovarian cancer facts were presented on the table tents at the conference, which could have skewed the results on the pretest and posttest. Conference attendees also received a patient resource handout upon registering at the conference. The patient resource handout contained ovarian cancer facts, which could have altered results of the pretest and posttest. Q1, Q2, Q3, and Q4 could have been answered by referencing the table tents and the patient resource handout.

Kirkpatrick's Evaluation Model was used to evaluate the education presented. The first level of Kirkpatrick's Evaluation Model, learner satisfaction, was used to evaluate the respondents' perceptions of the conference. Overall, respondents reported a high level of satisfaction with the presenter, presentation, content, and panel discussion. The second level of Kirkpatrick's Evaluation Model, learning outcomes, evaluated the knowledge gained as a result of the conference. Overall, more answers were correct on the posttest compared to the pretest.

Objective Three

An ovarian cancer educational resource was created and distributed at the conference. Thirty attendees took a handout. On the conference evaluation, respondents were asked, “How confident are you in your ability to educate women about ovarian cancer?” Of the respondents, 62% ($n=18$) reported they were “very confident” and 38% ($n=11$) reported they were “somewhat confident.” Evaluation of the impact of the patient resource was beyond the scope of this study.

Limitations

Limitations of the project design and execution of the practice improvement project exist. One of the limitations was a relatively small number of attendees and respondents. There was also a lack of healthcare providers in attendance. Advertising for the event was also a challenge. Another limitation was the speaker not mentioning important educational information.

An increase in the sample size would have provided results that are more accurate. Forty-two individuals attended the conference. Thirty-six attendees were healthcare professionals, seven of whom did not complete the pretest and posttest or did not complete them in their entirety. Only 29 pretests, posttests, and evaluations were completed. Eight undergraduate nursing students, who were unable to attend, were able to watch the videotape of the conference and complete the pretest, posttest, and evaluation. All eight students chose not to complete the pretest, posttest, or the evaluation.

The majority of respondents were undergraduate nursing students. Much of recently published research about examining healthcare professionals’ knowledge about ovarian cancer is in reference to healthcare providers (physicians, physician assistants, NPs, and nurse midwives). The lack of CE credits available for conference attendance may have been a deterrent for some providers. As mentioned before, offering CE credit at educational conferences improves

attendance (Lefebvre et al, 2013). Due to a lack of resources (financial and time), CE credit was not obtained.

Attendance at the conference could have been increased with more advertising and by advertising sooner. Advertising for the conference was challenging. Since the conference was not affiliated with either of the large healthcare institutions in Fargo, ND, advertising within those institutions was difficult. The conference was advertised with advanced practice providers on Sanford's Advanced Practice Provider SharePoint site, within Sanford's Roger Maris Cancer Center, and with students and faculty within the College of Health Professions at NDSU. An attempt was made to advertise at North Dakota nursing associations and nursing programs at local colleges within the geographical area. Advertising with a state nursing association could not be accomplished, as their policy is not to advertise for events that they do not sponsor. Emails to nursing programs at local colleges were not returned.

During the presentation, the speaker did not mention an important piece of information regarding ovarian cancer screening. Screening for ovarian cancer in women of average risk is not recommended (Doubeni et al., 2016; Qaseem et al., 2014; Wilt et al., 2015). Screening options for ovarian cancer were discussed by the speaker, but it was not stated that screening average risk women is not recommended.

Recommendations

Due to the increase in correct responses on questions relating to ovarian cancer, as evidenced by comparing the posttests to the pretests, it is practical to recommend the ovarian cancer educational conference as a method to increase healthcare providers' knowledge of ovarian cancer. Room for improvement certainly exists. Recommendations for improvement

have been identified in order to increase healthcare professionals' awareness and knowledge about ovarian cancer.

The establishment of an annual ovarian cancer educational conference for healthcare professionals would likely further increase knowledge and awareness. Smith et al., (2009) have concluded that the frequency of attendance at educational events correlated with the likelihood of desired behaviors of healthcare professionals. In order to improve practice, the ACCP recommends that continuing education should consist of more than one exposure (Davis & Galbraith, 2009). By presenting information annually, healthcare professionals could receive updated information related to ovarian cancer.

Other improvements to the practice improvement project could be made. Approaches should focus on increasing attendance and increasing the number of attendees who are healthcare providers. In order to increase attendance and increase variety of professional background of attendees, the conference could be added to another healthcare event or conference. Another option would be to collaborate with a healthcare facility within the geographical region. As mentioned before, since turnout at an educational conference is increased when attendees have the opportunity to receive CE credits, the conference should offer approved CE credit (Lefebvre et al, 2013). Gaining CE approval may be easier to obtain by collaborating with a healthcare facility. In order to reach more individuals, who would otherwise be unable to attend, the conference could also be presented in a live webinar format.

Ovarian cancer education could be disseminated during gatherings of healthcare professionals, such as the North Dakota Nurse Practitioner Association's annual pharmacology conference and the North Dakota Academy of Physician Assistants' annual primary care seminar. Table tents with ovarian cancer information could be displayed on conference tables.

The video recording of the conference could be shared with healthcare professionals currently in practice as well as students in the healthcare field. Provider education could be offered in person or by video feed in a clinic over the lunch hour. Healthcare professionals working in a rural setting could join the noon conference via live video feed or the video could be offered on an as-needed basis on the employee education site.

There are various methods to create awareness and educate a diverse audience. Ovarian cancer seminars could be offered in the community to any interested public, private, or religious group, either as stand-alone events or at a community event, such as the Women's Showcase. The ovarian cancer handout created for this project or other ovarian cancer education materials could be placed in clinic waiting rooms or exam rooms. Pamphlets, educational material, bracelets, ribbons, stickers, or other ovarian cancer awareness products could be displayed at a variety of venues.

Implications for Practice

The results of the project support the need for increased ovarian cancer education among healthcare professionals. Knowledge about risk factors and symptoms of ovarian cancer and current screening guidelines and diagnostic tests for ovarian cancer are important for early detection. Awareness and knowledge of ovarian cancer can lead to early detection and may improve health outcomes in women diagnosed with ovarian cancer. When healthcare providers are more aware and knowledgeable about ovarian cancer, they are also able to educate women about the disease.

Dissemination

Dissemination of research findings is important to projects and provides a means to improve practice. The project's plan was presented at the NDSU College of Health Professions

Poster Presentation in April 2016 and at the North Dakota Nurse Practitioner Association Pharmacology Conference poster presentation in September 2016. The results of the ovarian cancer conference project were presented at the NDSU College of Health Professions Poster Presentation in March 2017. The videotape of the conference could be used as a means of dissemination. An executive summary of the project can be found in Appendix K.

Implications for Future Research

Further research projects on ovarian cancer education could involve the education of women. As stated earlier, women lack knowledge about ovarian cancer, specifically risk factors and symptoms of the disease (Goldstein et al., 2015; Lockwood-Rayermann et al., 2009). Women who are aware of the disease, either through personal experience or by knowing a woman with ovarian cancer, were more knowledgeable about the disease (Lockwood-Rayermann et al., 2009). Education presented to women about ovarian cancer is likely to increase awareness and knowledge. An increase in awareness and knowledge about ovarian cancer may lead to earlier diagnosis.

Since the outcome of the patient resource handout was beyond the scope of this study, future research could focus on the outcome of the ovarian cancer educational handout for women. The third and fourth levels of Curran and Fleet's (2005) modified version of Kirkpatrick's Evaluation Model could be used to evaluate the education. Project evaluation could be developed that measures change in healthcare professional performance and patient outcomes.

Application to Nurse Practitioner Role

NPs, practicing in a variety of healthcare settings, provide care to women. Many NPs work in primary care and are gatekeepers to women's healthcare. They have the opportunity to

recognize risk factors and early symptoms of ovarian cancer in their female patients. Early detection is associated with improved outcomes (Slatnik & Duff, 2015). NPs are well known for providing health education (American Association of Nurse Practitioners, 2017). They have the opportunity to educate women about risk factors and symptoms of ovarian cancer. As providers, educators, and advocates, NPs have the opportunity to enhance health outcomes of women with ovarian cancer.

Conclusion

As a result of the subtle symptoms of ovarian cancer and late stages at diagnosis, education of healthcare professionals about ovarian cancer is paramount. With knowledge about ovarian cancer lacking, creating educational opportunities for healthcare professionals may fill the gaps. Providing an ovarian cancer educational conference is one way to improve awareness and knowledge of ovarian cancer.

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APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL LETTER



October 27, 2016

Dr. Tina Lundeen
Nursing

Re: IRB Certification of Exempt Human Subjects Research:
Protocol #PH17077, "Increasing Awareness and Knowledge about Ovarian Cancer to Enhance Health Outcomes of Women"

Co-investigator(s) and research team: Elizabeth Hodny

Certification Date: 10/27/2016 Expiration Date: 10/26/2019
Study site(s): Dakota Medical Foundation Event Center
Sponsor: n/a

The above referenced human subjects research project has been certified as exempt (category # 1) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the original protocol materials (received 10/26/2016).

Please also note the following:

- If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
- The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.

Sincerely,

A handwritten signature in black ink that reads "Kristy Shirley".

Digitally signed by Kristy Shirley
DN: cn=Kristy Shirley, o=NDSU,
ou=Institutional Review Board,
email=kristy.shirley@ndsu.edu,
c=US
Date: 2016.10.27 07:34:04 -05'00'

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult http://www.ndsu.edu/research/integrity_compliance/irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

INSTITUTIONAL REVIEW BOARD

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

NDSU is an EO/AA university.

APPENDIX B. CONFERENCE ANNOUNCEMENT



OVARIAN CANCER CONFERENCE

TUESDAY, NOVEMBER 22, 2016

**Presented by: Dr. Anil Potti, MD, Medical Oncologist,
Cancer Center of North Dakota**

All healthcare professionals are invited to attend

Event features:

- Lecture and discussion
- Survivor and caregiver panel discussion

No cost to attend

Light lunch served

Please register online at:

<https://ovarian-cancer-conference-register.eventbrite.com>



Ovarian cancer . . . early detection is critical

**Tuesday,
November 22,
2016
6:00-8:00 p.m.**

**Dakota Medical
Foundation
4141 28th Ave S
Fargo, ND**

**Sponsored by:
Pam Solseng
Ovarian Cancer
Endowment Fund**

**Organized by:
Elizabeth Hodny,
NDSU DNP Student**

**For more information:
elizabeth.hodny@ndsu.edu**

APPENDIX C. INVITATION FOR CONFERENCE PARTICIPATION

NDSU North Dakota State University

Department of Nursing
1919 N University Drive
NDSU Dept. 2670
PO Box 6050
Fargo, ND 58108-6050
(701) 231-7395

Increasing Awareness and Knowledge About Ovarian Cancer to Enhance Health Outcomes of Women

Dear Conference Participant:

My name is Elizabeth Hodny. I am a graduate student in the Doctor of Nursing Practice program at North Dakota State University, and I am conducting a research project to increase awareness and knowledge about ovarian cancer among healthcare professionals. It is our hope, that with this research, we will learn more about how to increase awareness and knowledge about ovarian cancer.

Because you are healthcare professional, you are invited to take part in this research project. Your participation is entirely your choice, and you may change your mind or quit participating at any time, with no penalty to you.

It is not possible to identify all potential risks in research procedures, but we have taken reasonable safeguards to minimize any known risks.

By taking part in this research, you may benefit by gaining a better understanding of ovarian cancer. Benefits to others are likely to include advancement of knowledge. However, you may not get any benefit from being in this study.

It should take about 5-10 minutes to complete the questions in the pre- and post-tests and conference evaluation form.

We will keep private all research records that identify you. Your information will be combined with information from other people taking part in the study, we will write about the combined information that we have gathered. You will not be identified in these written materials. We may publish the results of the study; however, we will keep identifying information private.

If you have any questions about this project, please contact me at (218) 686-9660 or elizabeth.hodny@ndsu.edu, or contact my advisor Dr. Tina Lundeen at (701) 231-7747 or tina.lundeen@ndsu.edu. You have rights as a research participant. If you have questions about your rights or complaints about this research, you may talk to the researcher or contact the NDSU Human Research Protection Program at 701.231.8995, toll-free at 1-855-800-6717, by email at ndsu.irb@ndsu.edu, or by mail at: NDSU HRPP Office, NDSU Dept. 4000, P.O. Box 6050, Fargo, ND 58108-6050.

Thank you for taking part in this research.
Sincerely,

Elizabeth Hodny, RN, BSN, DNP-S

APPENDIX D. OVARIAN CANCER PRESENTATION OUTLINE

- Objectives
 - Identify risk factors for ovarian cancer
 - Recognize symptoms of ovarian cancer
 - Discuss ovarian cancer screening recommendations
 - Discuss the different stages of ovarian cancer
 - Identify treatment options for ovarian cancer
- What is ovarian cancer?
- Types of ovarian cancer
- Genetics
- Risk factors
 - Increased risk
 - Protective factors
- Presentation
- Screening and early detection
- Stages
 - Stage 1
 - Stage 2
 - Stage 3
 - Stage 4
- Treatment
 - Surgery
 - Chemotherapy

APPENDIX E. PRE-TEST

- 1. What features contribute to the mortality of ovarian cancer?**
 - a. Lack of routine screening recommendations
 - b. Vague symptoms
 - c. Diagnosis in late stages
 - d. All of the above

- 2. Screening women of average risk for ovarian cancer is:**
 - a. Recommended using the CA-125 tumor biomarker test
 - b. Recommended using transvaginal ultrasonography
 - c. Not recommended
 - d. A and B

- 3. Early symptoms of ovarian cancer include all of the following EXCEPT:**
 - a. Change in bowel habits
 - b. Early satiety
 - c. Bloating
 - d. Change in vulva color
 - e. Pelvic/abdominal pain

- 4. What factors increase a woman's risk of developing ovarian cancer? (Select all that apply)**
 - a. Late menarche
 - b. Family history of breast cancer
 - c. Late menopause
 - d. Nulliparity
 - e. Oral contraceptive pill use
 - f. Family history of ovarian cancer

- 5. What assessments should be performed or what tests should be ordered if a patient is suspected to have ovarian cancer?**
 - a. Physical exam (pelvic exam)
 - b. CA-125 tumor biomarker test
 - c. Transvaginal ultrasonography
 - d. All of the above

APPENDIX F. RESPONDENT DEMOGRAPHICS

Primary professional role (check one):

Student:

- nursing – undergraduate
- nursing – graduate
- pharmacy

Nurse:

- LPN
- RN

Advanced Practice RN:

- Nurse Practitioner
- Nurse Midwife
- Clinical Nurse Specialist

Physician Assistant

Physician

Other (please list) _____

Area of practice (if applicable): _____

Years in practice (if applicable): _____

APPENDIX G. POST-TEST

1. **What features contribute to the mortality of ovarian cancer?**
 - a. Lack of routine screening recommendations
 - b. Vague symptoms
 - c. Diagnosis in late stages
 - d. All of the above**

2. **Screening women of average risk for ovarian cancer is:**
 - a. Recommended using the CA-125 tumor biomarker test
 - b. Recommended using transvaginal ultrasonography
 - c. Not recommended**
 - d. A and B

3. **Early symptoms of ovarian cancer include all of the following EXCEPT:**
 - a. Change in bowel habits
 - b. Early satiety
 - c. Bloating
 - d. Change in vulva color**
 - e. Pelvic/abdominal pain

4. **What factors increase a woman's risk of developing ovarian cancer? (Select all that apply)**
 - a. Late menarche
 - b. Family history of breast cancer**
 - c. Late menopause**
 - d. Nulliparity**
 - e. Oral contraceptive pill use
 - f. Family history of ovarian cancer**

5. **What assessments should be performed or what tests should be ordered if a patient is suspected to have ovarian cancer?**
 - a. Physical exam (pelvic exam)
 - b. CA-125 tumor biomarker test
 - c. Transvaginal ultrasonography
 - d. All of the above**

*Correct answers are in bold type

APPENDIX H. CONFERENCE EVALUATION

Please rate the following according to the scale:

- 1 – needs work
- 2 – good
- 3 – very good
- 4 – excellent

The presenter:

	1 Needs work	2 Good	3 Very good	4 Excellent
Enthusiasm				
Interaction with audience				
Apparent knowledge of the topic				

The presentation:

	1 Needs work	2 Good	3 Very good	4 Excellent
The information was presented in an organized manner				
Related information to practical problems				
Quality of audiovisual				

The content:

	1 Needs work	2 Good	3 Very good	4 Excellent
The volume and complexity of the information was appropriate				
Content was evidence-based				
Content was relevant to practice				

The panel:

	1 Needs work	2 Good	3 Very good	4 Excellent
Discussion contributed to overall learning				

After this conference, how confident are you in your ability to educate women about ovarian cancer? (circle one)

Not confident A little confident Somewhat confident Very confident

(Wood, Marks, & Jabbour, 2005)

APPENDIX I. PATIENT EDUCATION RESOURCE

OVARIAN cancer

Early recognition is key

Ovarian cancer occurs in

1
OUT OF EVERY



More than 70% of cases of ovarian cancer are diagnosed in advanced stages

Screening for ovarian cancer is NOT recommended in average-risk women

It is estimated that in the U.S. in 2016 . . .

22,280

women will be diagnosed with ovarian cancer

14,240

women will die from the disease

SYMPTOMS

- Bloating
- Pelvic or abdominal pain
- Difficulty eating
- Feeling full quickly
- Urinary symptoms (frequency or urgency)

RISK FACTORS

- Family history of ovarian or breast cancer
- Increasing age
- Hormone replacement therapy use
- Obesity

For more information:

- Visit your healthcare provider
- American Cancer Society at www.cancer.org/cancer/ovariancancer/
- Minnesota Ovarian Cancer Alliance at www.mnovarian.org

APPENDIX J. PHOTOGRAPH AND VIDEO RELEASE FORM

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio or video recordings may be used for the following purposes:

- conference presentations
- educational presentations or courses
- informational presentations
- on-line educational courses
- educational videos

By signing this release, I understand this permission signifies that photographic or video recordings of me may be electronically displayed via the Internet or in the public educational setting.

I will be consulted about the use of the photographs or video recording for any purpose other than those listed above.

There is no time limit on the validity of this release nor is there any geographic limitation on where these materials may be distributed.

This release applies to photographic, audio or video recordings collected as part of the sessions listed on this document only.

By signing this form, I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for educational purposes.

Full Name _____

Street Address/P.O. Box _____

City _____

Prov/Postal Code/Zip Code _____

Phone _____ Fax _____

Email Address_____

Signature_____ Date_____

If this release is obtained from a presenter under the age of 19, then the signature of that presenter's parent or legal guardian is also required.

Parent's Signature_____ Date_____

APPENDIX K. EXECUTIVE SUMMARY

Background

Ovarian cancer is the fifth leading cause of cancer death among women in the U.S. and kills approximately 14,000 women each year (Nezhat et al., 2015). Survival increases with early diagnosis; the five-year survival rate in stage I is 90%. Symptoms are vague and common to many health diseases, which may well explain why upwards of 70% of women with ovarian cancer are diagnosed at stage III or IV (Slatnik & Duff, 2015). Preventative guidelines in the U.S. do not recommend screening for ovarian cancer in women of average risk (AAFP, 2016b; ACOG, 2011; Doubeni et al., 2016; Moyer, 2012; NCCN, 2015; Qaseem et al., 2014; Wilt et al., 2015). A lack of screening recommendations and a subtle presentation point to the need for greater healthcare professional recognition of symptoms and risk factors of ovarian cancer, which can then lead to a prompt diagnosis.

While healthcare professionals have the opportunity to improve health, gaps in knowledge exist related to ovarian cancer risk factors and symptom recognition (Gajjar et al., 2012). Continuing education improves healthcare professionals' performance and patient health outcomes (Cervero & Gaines, 2015). Increasing healthcare professionals' knowledge of ovarian cancer may help to detect ovarian cancer in earlier stages and enhance health outcomes of women.

Project Summary

Based on the ovarian cancer knowledge deficit among healthcare professionals, an ovarian cancer educational conference was developed and presented to healthcare professionals. The conference focused on presenting risk factors and symptoms of ovarian cancer. The conference was offered on a weekday evening for approximately two hours and was provided at

no cost to attendees. The target audience was healthcare professionals, to include physicians, NPs, physician assistants, nurse midwives, nurses, pharmacists, nursing students, and pharmacy students. Since women also are not well informed about ovarian cancer, an ovarian cancer patient resource was created and distributed at the conference to assist in educating patients.

Results

The conference was evaluated through a pretest, posttest, and conference evaluation survey. Data regarding type of primary professional role was collected, as well, during the conference. The conference was attended by 35 healthcare professionals, 29 of whom responded to the pretest, posttest, and evaluation survey. The majority of respondents were undergraduate nursing students ($n=15$). Other respondents included graduate nursing students ($n=3$), registered nurses ($n=4$), pharmacy students ($n=4$), pharmacists ($n=2$), and not defined ($n=1$).

After the conference, correct responses increased in the areas of risk factor and symptom recognition. The number of correct responses remained the same regarding exams and testing for ovarian cancer. The number of correct responses decreased in the areas of ovarian cancer mortality and screening. Conference respondents were asked to rate the extent to which the panel's discussion contributed to their overall learning. Twenty-one respondents rated the panel "excellent" and eight respondents rated the panel "very good." Respondents were also asked "How confident are you in your ability to educate women about ovarian cancer?" Eighteen reported they were "very confident" and 11 reported they were "somewhat confident." Overall, the respondents indicated the ovarian cancer conference had a positive impact on attendees and increased awareness and knowledge about ovarian cancer among healthcare professionals.

Recommendations

Due to the increase in correct responses on questions relating to ovarian cancer, as evidenced by comparing the posttests to the pretests, it is practical to recommend the ovarian cancer educational conference as a method to increase healthcare providers' knowledge of ovarian cancer. Room for improvement often exists. Recommendations for improvement have been identified in order to increase healthcare professionals' awareness and knowledge about ovarian cancer.

The establishment of an annual ovarian cancer educational conference for healthcare professionals would likely further increase knowledge and awareness. As Smith et al., (2009) concluded, the frequency of attendance at educational events correlated with the likelihood of desired behaviors of healthcare professionals. In order to improve practice, the ACCP recommends that continuing education should consist of more than one exposure (Davis & Galbraith, 2009). By presenting information annually, healthcare professionals could receive updated information related to ovarian cancer.

Other improvements to the practice improvement project could be made. Approaches should focus on increasing attendance and increasing the number of attendees who are healthcare providers. In order to increase attendance and increase variety of professional background of attendees, the conference could be added to another healthcare event or conference. Another option would be to collaborate with a healthcare facility within the geographical region. As mentioned before, since turnout at an educational conference is increased when attendees have the opportunity to receive CE credits, the conference should offer approved CE credit (Lefebvre et al, 2013). Gaining CE approval may be easier to obtain by collaborating with a healthcare

facility. In order to reach more individuals, who would otherwise be unable to attend, the conference could also be presented in a live webinar format.