Middle East
Journal of Nursing

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In this issue a number of papers deal with cancer issues and others deal with social issues.

A review paper from Jordan looked at the persistence of negative attitudes towards cancer pain and its treatment. The author outlines the persistence of negative attitudes towards cancer pain and its treatment suggests there is scope for identifying more effective pain education strategies. These strategies must be built on understanding of the different aspects regarding cancer pain and this represents the aim of this paper which is to identify the clinical significance of cancer pain, explain in detail patient related barriers, diagnostic and assessment tools for cancer pain and recent evidence based results regarding pharmacological and non pharmacological management, and finally to reflect how nurses skilled in this aspect can used for cognitive behavioural based education for effective control of cancer pain.

A case study from Bangladesh looked at the effect of Parent's education and its impact on child mortality. The author indicated that child mortality is a sensitive index of development and often reflects a country's quality of life. The author stressed that his study shows that some of these selected factors significantly effects on child mortality. These factors are educational status of women, monthly income, age at first marriage, medical checkup during pregnancy and type of delivery.

A paper from Jordan looks at the risk factors and aetiology of pressure ulcers in oncology patiemts. The authors comclude that developing a program or protocol for early assessment and prevention of pressure ulcer has a major impact on reducing its incidence and improving the outcome of oncology patients.

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NURSING ROLE IN MANAGING PATIENT RELATED BARRIERS TO EFFECTIVE CANCER PAIN MANAGEMENT

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Abstract

The persistence of negative attitudes towards cancer pain and its treatment suggests there is scope for identifying more effective pain education strategies. These strategies must be built on understanding of the different aspects regarding cancer pain and this represents the aim of this paper which is to identify the clinical significance of cancer pain, explain in detail patient related barriers, diagnostic and assessment tools for cancer pain and recent evidence based results regarding pharmacological and non pharmacological management, and finally to reflect how nurses skilled in this aspect can used for cognitive behavioural based education for effective control of cancer pain.

Methodology: To achieve the objective of this paper three databases were searched Pubmed , Science Direct, and High Wire in addition to electronic books. The dates searched were between 2004 - 2010 except for the assessment tools for pain; only English resources were included.

Key words: cancer pain, assessment, treatment, pathophysiology, nursing education, patient related barrier

Introduction

Pain is a subjective and individual experience. The international association for the study of pain (IASP) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Ahles, Blanchard, & Ruckdeschel , 1983; Mersky, & Bogduk, 1994). Cancer pain doesn't have a specific definition but it was defined as pain in patients caused by neoplastic disease itself and / or diagnostic procedure or treatment (biopsy, chemotherapy, radiotherapy, surgery) (Bonica et al., 1990; Jacox et al., 1994).

Cancer pain is a significant concern in patients with cancer because it's the most prevalent and severe symptom of cancer. It is noted in 20%-50% of patients during the early stages of the disease, 30%-40% during treatment and 75%-90% of patients in the advanced stage (Komurcus et al., 2004; Ludorff, Peuckman, & Sjogren, 2008),. Despite major advances in cancer pain management , it was determined that more than 50% of patients with cancer don't receive adequate pain treatment (Aydinli et al., 2004; Ozkan et al., 2004). Despite the numerous educational programs, published pain management guidebooks and pharmacological and non-pharmacological pain management strategies there are barriers related to caregiver, and health systems and patient related barriers reduce the chance to achieve effective pain management (Ludorff, Peuckman, & Sjogren, 2008; Ozkan et al., 2004). Patient related barriers to cancer pain management can be classified into three types; cognitive, affective "emotional" and sensory "physical". In addition to the role of effective communication (Jacobsen, Muldrup, & Christrup , 2009), patient related cognitive barriers which reflected this attitude can be classified into three concerns; concern about analgesia "fear of addiction", concern about pain communication "to be a good patient" and maladaptive beliefs about the possibility of controlling cancer pain i.e. " belief that pain related to cancer is inevitable " (Bostorm, Sandh, & Lundberg , 2005; Coyle et al., 2004; Lai et al., 2003 ; Randall, 2003). It was suggested that there is an association between cognitive-emotional barrier and reflected behavior and this can be explained by noticing that patients with cancer pain and who have symptoms of stress and depression will have maladaptive beliefs and concern about reporting pain or using pain medication (Thomas, Elliott, Douglas, & Gold , 2005; Vallerand, Hasanan, Templin, & Collius, 2005).

This review will be guided by cognitive-behavior theory based on using nursing education about pain in changing irrational, faulty and maladaptive thinking and beliefs of patients with cancer pain and improving their coping ability by overcoming their attitudinal barriers regarding their compliance with the treatment regimen.

Cancer pain is conceptualized as a multidimensional experience with physiological, sensory, affective, cognitive and behavior diminution, the physiological and sensory diminution are related to pain characteristics; the cognitive and the behavior components are related to the meaning of, and attitude toward pain (Mantyh, & Wall, 2006). This interprets why the pathophysiology mechanism which is represented by sensory perception of pain will be recognized cognitively by the patient, so it will affect his/her attitude toward it, which is consistent with cognitive-behavior theory. Different causes of cancer pain represent different physiological mechanisms that interpret how the sensory information from sense organs moves and is processed in the cerebral cortex.

The most common explanation of pathophysiological mechanism of cancer pain is that tumor cells secrete a wide range of factors such as prostaglandins, interleukins and different growth factors that directly excite or sensitize the primary afferent neuron. Also insufficient vascular supply to tumor cells cause ischemia and local acidosis, which excites sensory neurons (Paul, Christo, & Danesh, 2008). Tumor growth can entrap and injure nerves, causing mechanical injury and compression of the nerve which stimulates sensory neurons. Additionally that cancer pain is induced and maintained partly by central sensitization which can lead to the perception of normally non-noxious stimuli as noxious (Trevor, Edmund, Christopher, & Robert, 2008).

To identify the clinical presentation of cancer pain, cancer pain classifications should be mentioned because each type has a special clinical presentation sign and symptom. It has been suggested that cancer pain can be classified, based on the involved structure (somatic, visceral , neuropathic pain) and according to the time (acute and chronic); acute pain may be caused by the diagnostic or treatment intervention, while chronic

pain is pain that persists more than three month or recurs over several months beyond the usual course of acute illness or injury. It can also be because or the disease or its treatment regimen (Cheruy et al., 2006), with 'breakthrough pain', a transient exacerbation of pain that occurs in addition to the otherwise stable persistent pain (Portenoy, & Hagon, 1990). On the other hand classification is based on structure, as previously mentioned and classified into somatic, visceral, and neuropathic pain. Somatic pain results from direct injury to bone or tissue represented as a well localized dull feeling, throbbing and growing sensation. The second type is visceral pain which occurs as result of tumor effect on the organ within the abdomen, pelvic or thorax represented clinically as a poorly localized feeling of deep squeezing, and pressure like radiation sometimes associated with nausea, vomiting and diaphoresis. Finally neuropathic pain results from peripheral or central neural injury from cancerous cells, seen clinically as a feeling of poor localized stinging, numbness, burning, radiation, shock like, allodynia and hyperalgesia. (Mazanec et al., 2001; Paul, Christo, & Danesh, 2008; Rachel et al., 2004). Table 1 provides a summary of important feature of these types of pain.

Pain assessment and diagnostic tools can be categorized into three types. The first type is concerned with assessing pain intensity and characteristics; the second type assesses the psychosocial aspect of pain and this type represents the focus of this review because it is built based on cognitive behavior theory measuring effect of cancer pain and treatment on a patient's cognition and behavior; the third type is diagnostic evaluation through laboratory, and radiology tests.

Assessing pain intensity and characteristics can be performed by many scales and tools such as; Brief Pain Inventory short form (BPI) which is one of the most frequently used tools to assess

multidimensional cancer pain. It is designed to measure the subjective intensity of pain and the impairment caused by pain. The most important feature of this tool is that it assesses pain history, intensity, location, quality, and impact on quality of life, see Figure 1. Cronbach's alpha of this tool is 87 (Puntill et al., 1991; Rustoen et al., 2005). The second group of tools assessing pain intensity started with the Visual Analogue Scale (VAS), and consists of a 10 cm line with no markings except 'no pain' at one end and 'worst imaginable pain' at the other end. The patient should be asked to mark a point on the line that represents their pain. The distance from no pain to the patient's mark is then measured in millimeters to give a score out of 100. For the Verbal Rating Scale (VRS) the patient is asked to select from a list of words describing the severity. Some patients find it easier using words than numbers, for ease of documentation. In another tool, also called a Numerical Rating Scale (NRS) the patient is asked to give a number between 0 and 10, where 0 is no pain and 10 is the worst pain imaginable. For children, pain can be assessed using Wong-Baker FACES Pain Rating Scale in addition to the (QPORSTU) tool which assesses the defining characteristic of pain. The reliability and validity of this tools has been established (Hockenberry et al., 2005; Wong et al., 2001) see Figure 2 (page 6).

The second type is the diagnostic evaluation test used to evaluate recurrence and progression of the disease or tissue injury related to cancer treatment including: tumor marker, blood test, radiological studies, and neurophysiological tests (Jacox, Carr, & Payne et al., 1994). Finally the last type of assessment tools is psychosocial assessment tools which are the most important based on the objective of this review, because the nurse can rely on it in conducting educational sessions based on the assessed cognitive and behavior needs of the patient, consistent with the implication of cognitive behavior theory concepts.

Pain type	Mechanism	Pain pathway	Clinical presentation	Description	Location
Somatic	Activation of nociceptors arises from direct injury to bone tissue or tendon	Normal	Dull Aching Sharp Throbbing Growing	Well localized	Bone and soft tissue
Visceral	Activation of nociceptors arises from organ damage or tumor infiltration, compression, or distortion of organ within the abdomen, pelvis, thorax	Normal	Squeezing Pressure like radiation Nausea and vomiting	Poorly localized	Chest and abdomen
Neuropathic	Peripheral or central neural structure injury caused by direct tumor infiltration or damage or treatment	Aberrant	Stinging Numbness Burning Radiation allodynia	Poorly localized	Extremities and spine

Table 1: most important characteristic about different pain type

Four tools will be discussed in this review. The first tool is the Barriers questionnaire (BQ-II) which is a 27-item self-reporting instrument that measures a patient's beliefs about cancer pain and the use of analgesics and categorizes these into different areas (addiction, tolerance, side effects, fatalism, impaired immune function, being good (i.e., "good" patients do not complain about pain), distracting the medical doctor, and the notion that analgesics may block or mask one's ability to monitor symptoms, taken into consideration (Ward et al., 1993). that the secondary part of this assessment tool is that Cronbach's alpha of this tool is 89.

The second assessment tool is the self efficacy scale which is composed of 22 items presented as questions on a numeric rating scale ranging from (very uncertain) to 100 (certain) and which has three subscales assessing pain management (5 items), physical function (8 items).and coping with other symptoms. The reliability of

Date: _____ / _____ / _____   Time: _____

Name: _____ _____ _____
                Last   First   Middle intial

1) Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

   1. Yes   2. No

2) On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.
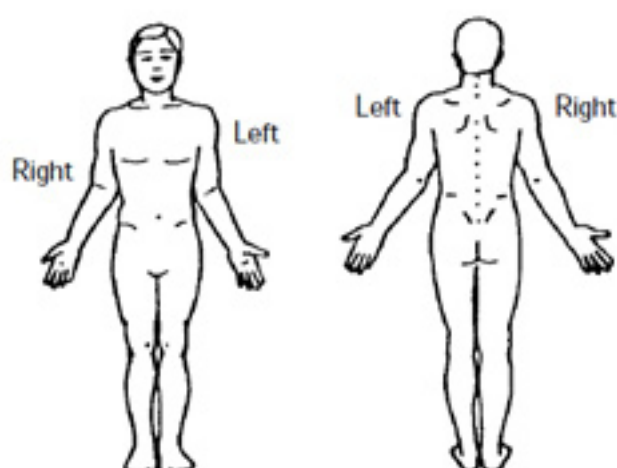
3) Please rate your pain by circling the one number that best describes your pain at its **worst** in the past 24 hours.

0	1	2	3	4	5	6	7	8	9	10

No pain   Pain as bad as you can imagine

4) Please rate your pain by circling the one number that best describes your pain at its **least** in the past 24 hours.

0	1	2	3	4	5	6	7	8	9	10

No pain   Pain as bad as you can imagine

5) Please rate your pain by circling the one number that best describes your pain on **average**.

0	1	2	3	4	5	6	7	8	9	10

No pain   Pain as bad as you can imagine

6) Please rate your pain by circling the one number that tells how much pain you have **right now**.

0	1	2	3	4	5	6	7	8	9	10

No pain   Pain as bad as you can imagine

7) What treatments or medications are you receiving for your pain?

_____

_____

8) In the past 24 hours, how much **relief** have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received.

0%	10	20	30	40	50	60	70	80	90	100%

No relief   Complete relief

9) Circle the one number that describes how, during the past 24 hours, pain has **interfered** with your:

A. General activity

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

B. Mood

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

C. Walking ability

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

D. Normal work (includes both work outside the home and housework)

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

E. Relations with other people

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

F. Sleep

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

G. Enjoyment of life

0	1	2	3	4	5	6	7	8	9	10

Does not interfere   Completely interferes

Figure 1: Brief pain inventory (adapted with permission)

Visual analogue scale (VAS)

A 10cm line with no markings except 'no pain' at one end and 'worst imaginable pain' at the other end. The patient should be asked to mark a point on the line that represents their pain. The distance from no pain to the patient's mark is then measured in millimetres to give a score out of 100.

1
No pain

10
Worst
Possible
pain

Verbal rating scale (VRS)

The patient is asked to select from a list of words describing the severity. Some patients find it easier using words than numbers. For ease of documentation, many organisations provide a number alongside which can more easily be documented.

No pain   (0)
Mild pain   (1)
Moderate pain   (2)
Severe pain   (3)

Numerical rating scale (NRS)

The patient is asked to give a number between 0 and 10, where 0 is no pain and 10 is the worst pain imaginable.

No
pain

Distressing
pain

Unbearable
pain

1   2   3   4   5   6   7   8   9   10
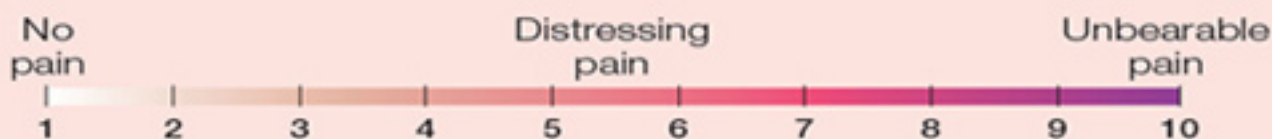
Faces e.g. Wong-Baker FACES Pain Rating Scale

Originally used for children, has also been used successfully in older adults.

0
No hurt

1
Hurts
little bit

2
Hurts
little more

3
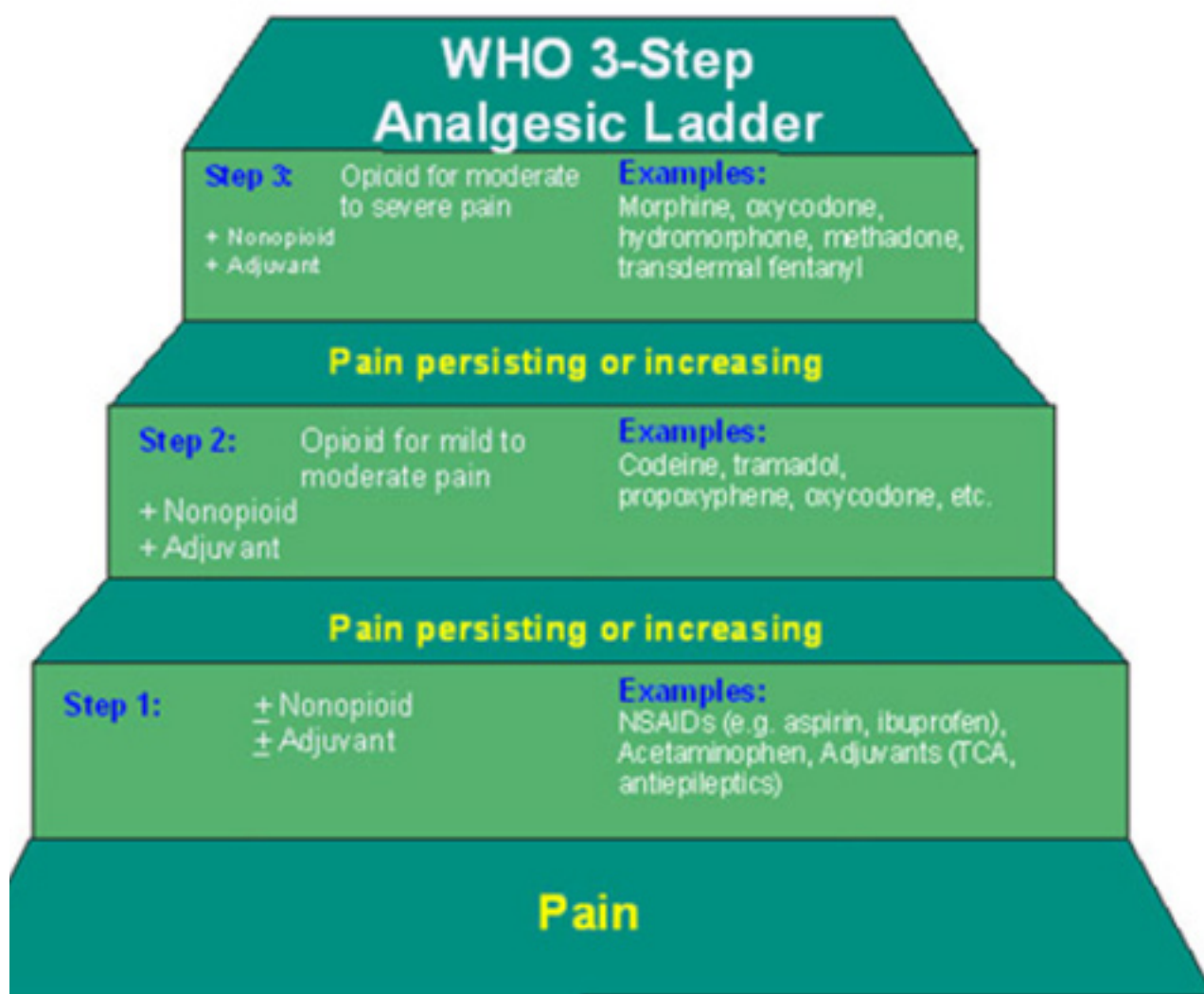Hurts
even more

4
Hurts
whole lot

5
Hurts
worst

Brief word instructions:

Point to each face using the words to describe the pain intensity.
Ask the child to choose the face that best describes their own pain and record the appropriate number.

Source: Hockenberry et al (2005)

Figure 2: Pain intensity assessment tool

Figure 3: World Health Organization 3-Step Analgesic Ladder with examples of analgesics Adapted from Management of Cancer Pain: Clinical Practice Guideline Number 9. Rockville, MD: U.S. Department of Health and Human Services; 1994, AHCPR Pub No. 94-0592.

this tool also well establishes Cronbach's alpha of this tool which is 88 (Anderson et al., 1995). The third tool I would like to mention is the coping strategies questionnaire which is used to measure coping in a chronic pain patient, and contains eight coping strategies which are diverting attention, reinterpreting pain sensation, coping self-statements, ignoring pain sensation, praying or hoping, and catastrophizing, with each one measured by six items. Cronbach's alpha for the subscale ranges from 7-,84 (Jensen et al., 1991). Finally regarding quality of life, the European organization for research and treatment of cancer quality of life questionnaire is used, comprised of five function scales (physical, role, cognitive, emotional, and social); seven symptom scales (fatigue, pain, nausea and vomiting, dyspnoea,

insomnia, appetite loss, and constipation); a financial difficulties scale; and a global health function scale (Aaronson et al., 1993).

There are many treatment modalities for cancer pain; pharmacological and non-pharmacological. The pharmacological treatment modality is based on the World Health Organization's (WHO) recognition that there is a global need to establish guidelines for basic pain control in cancer patients. As a result of that a "3-step analgesic ladder was developed" in 1986 for use among practitioners, see Figure 3 (Jadad , & Browman, 1995). The stepwise approach in the WHO ladder suggests to start with non-opioid medication like (acetaminophen, ibuprofen, NSAID) which is suggested is effective in

mild pain (step 1) (Mercadantes et al., 1999), and a combination of products, such as acetaminophen or aspirin plus codeine, hydrocodone, propoxyphene, or oxycodone, for moderate pain (step 2) , and for severe pain it was suggested using a strong opioid like morphine, hydromorphone, oxycodone, methadone, or transderma fentanyl for severe pain (step 3) (Zech ,1995). There is a fourth step which has been added to WHO ladder which is a procedural/intervention step and the rationale of that is it was noticed that cancer pain rarely progresses in a stepwise fashion as indicated by WHO.

As a complementary therapy for pharmacological treatment for cancer pain there are many non-pharmacological treatment modalities for cancer pain. These

treatments are directed at the source of cancer pain and enhance patient function.

Vertebroplasty

This method includes injection of methylmethacrylate into a pain sensitive vertebral body in order to solidify the lesion and can achieve rapid resolution of pain and restoration of spine stability in 1-3 days (Fourney, 2003).

Radiofrequency Tumor Ablation

This therapy can produce significant pain relief from certain cancerous conditions especially liver cancer (Neeman, & Wood, 2002).

Surgery

It is very effective in alleviating pain especially if it is associated with condition induced pain from obstruction of the esophagus, colon, biliary tract (Amersi, Stomas, & Ko, 2004).

Chemotherapy

It is suggested that tumor response to chemotherapy will lead to relief of pain sensation even without tumor shrinkage (Burris, 1997).

Bisphosphonates

It inhibits osteoclast activity, adheres strongly to bone with long half life; it has been suggested that it can effectively reduce bone pain (Wong, & Wiffen, 2002).

Radiopharmaceuticals

These agents deposit radiation directly to the affected region of the bone, and can reduce pain for 6 months or more in 60-80% of patients with metastatic breast and prostate cancers (Roger, Speiser, & Rom, 1998).

Corticosteroids

This medication inhibits prostaglandin synthesis and reduces neural tissue edema used as adjuvant therapy for cancer pain (Rousseau, 2001).

Anticonvulsant/Antidepressant

Based on the reviewed studies it was suggested that this medication is effective against neuropathic cancer pain (Bennett, & Simpson, 2004; McQuay, 1996).

Effect of nursing education

Nursing usage of cognitive behavioral treatment in holding an education intervention to overcome patient related cognitive - behavioral barriers are based on cognitive - behavior theory which recognizes pain as a complex experience that is not only influenced by its underlying pathophysiology but also by an individual's cognition, affect, and behavior (Keefa, & Gil, 1986 ; Turk, Meichenbann, & Genest,1983).

The first step in cognitive behavioral treatment is pain education. In this step nurses provide patients with information about pain, as a sensory and emotional experience and that it is influenced by their own thoughts, feelings, and behaviors. By discussing this topic, patients understand how their own responses to pain influences their pain experience and start to recognize the role that their own coping efforts can play in pain control, which leads to achieve effective pain management. This was improved by two studies conducted recently to improve the effectiveness of nursing education on those aspects in achieving significant decrease in pain intensity and increase in patient satisfaction (Lin, Chou, Wu, Chang, & Lai, 2006; Yasemin, Fadiloqlu, & Meltemu, 2009).

The second step is to provide patients with information about effective coping mechanisms and training the patient in them. Training is provided in a wide variety of cognitive and behavioral pain coping strategies, for example, instruction and training about progressive relaxation and cue-controlled brief relaxation exercises are used to decrease muscle tension, reduce emotional distress, and divert attention from pain. Training in distraction techniques such as pleasant imagery, counting methods,

and use of a focal point helps patients learn to divert attention away from severe pain episodes. Cognitive restructuring is used to help patients identify and challenge overly negative pain-related thoughts and to replace these thoughts with more adaptive, coping thoughts. The effectiveness of this step has been improved by many studies that integrate the education and training on different coping mechanism in their educational interventions for patients with cancer pain and fatigue and the result show significant changes in patient attitudinal barrier and the participant reports significant reduction in pain levels (Kathleen et al, 2008; Tami et al., 2010).

The last step that followed education intervention; is application of learned skills to assure effectiveness of the provided information and this can be established by continuous assessing of pain levels after the educational session has been held. Based on the previously mentioned step we noticed that nursing education when applied and based on cognitive behavior theory, was started by identifying patient knowledge about pain then by education, increase in their knowledge about the general aspects of cancer pain experience and this included training them in new coping mechanisms that reflected on their behavior in order to achieve effective pain management.

References

Aaronson,K., (1993) The European Organization for Research and Treatment of Cancer QLQ-C30: A Quality-of-Life instrument for use in international clinical trials in oncology. J. National Cancer Inst, 85(5): 365-376.

Amersi, F., Stamos, J., Ko, Y. (2004) Palliative care for colorectal cancer. Surgery. Oncol. Clin. North Am. (13): 67-77.

Anderson,O. (1995) Development and initial validation of a scale to measure self efficacy beliefs in patients with chronic pain. Pain, 63(1): 77-83.

Aydinli, I. Cancer pain. (2004) Klinik Gelisim, (17): 3-15.

BegcivaN, G., Tosun, N., Komurcu, S., Akbayrak, N., Ozet, A. (2009) Analysis of patient in cancer pain management in Turkish patient. Pain management and symptom, (38):727-737.

Bennett, I., Simpson, H. (2004) Gabapentin in the treatment of neuropathic pain. A review. Palliat Med, (18): 5-11.

Borneman, T., Koczywas,M., Yisun, V., Piper, B., Uman, G., Ferrell, B., (2010) Reducing patient barriers to pain and fatigue management. Pain and symptom management,39(3): 486-501.

Bostrom, B ., Sandh, M ., Lundberg, D., (2003) Fridlund, A. comparison of pain and health-related quality of life between two groups of cancer patients with differing average levels of pain. Journal Clinical Nursing, (12):726-35.

Burris, A. (1997) Improvements in survival and clinical benefit with gemcitabine as first-line therapy for patients with advanced pancreas cancer: a randomized trial. Clinical Oncology, (15): 2403-2413.

Cherny, N.I., Wall and Melzack`s Texbook of Pain. Fifth ed, (2006) S.B. McMahon and M. Koltzenburg: Elsevier Churchill Livingstone.

Christo, P., Mazloomdoost, D.(2008) Cancer pain and analgesia. pain and symptom management ,(10):278-298.

Cohen, Z., Musgrave, F., McGuire, B., Strumpf, E., Munsell, F., Mendoza, R. (2005) The cancer pain experience of Israeli adults 65 years and older: the influence of pain interference, symptom severity, and knowledge and attitudes on pain and pain control. Support Care Cancer, (13):708-714.

Coyle, N. (2004) In their own words: seven advanced cancer patients describe their experience with pain and the use of opioid drugs. Journal Pain Symptom Management, (27):300-309.

Fahey, K., Rao, S., Douglas, M., Thomas, M., Elliott, J., Miaskowski, C. (2008) Nursing coaching to explore and modify attitudinal barriers interfering with effective pain management. Oncology nursing forum, 35(2) : 233-240.

Foley, M. (1990) Pain syndromes in patients with cancer , J.J. Bonica (Ed), Advances in pain research and therapy, Vol 2, Raven Press, New York.

Fourney, R . (2003) Percutaneous vertebroplasty and kyphoplasty for painful vertebral body fractures in cancer patients. J. Neurosurgery, (98): 21-30

Gunnarsdottir, S., Donovan, S., Serlin, C., Voge, C., Ward, S. (2002) Patient-related barriers to pain management: the barriers questionnaire II (BQ-II). Pain, (99):385-396.

Gunnarsdottir, S., Serlin, C., Ward, S. (2005) Patient related barriers to pain management: the Icelandic barriers questionnaire II. J Pain Symptom Manage, (29):273-285.

Jacobsen, R., Møldrup, C., Christrup, L., Sjøgren, P. (2009) Patient related barriers to cancer pain management: a systematic exploratory review. Science Journal of Caring, 23(1):190-208.

Jacox, A., Carr, B., Payne, R. (1994) Management of cancer pain. Clinical practice guideline No. 9. Rockville [MD]: US Department of Health and Human Services, Agency for Health Care Policy and Research. AHCPR Pub, 94-0592.

Jadad, R ., Browman, P. (1995) The WHO analgesic ladder for cancer pain management. Stepping up the quality of its evaluation. Jama, (274):1870-1874.

Jadad, R., Browman, B. (1995) The WHO analgesic ladder for cancer pain management. Stepping up the quality of its evaluation. JAMA, (274): 1870-1873.

Jensen, P. (1991) Coping with chronic pain: a critical review of the literature. Pain, 47(3): 249-283.

Komurcu, S. (2006) Cancer pain. Turkish Journal of Medical Surgery, (2):54-57.

Lai, H., Dalton, A., Belyea, M., Chen, L., Tsai,Y., Chen, C. (2003) Development and testing of the pain opioid analgesics beliefs scale in Taiwanese cancer patients. Journal Pain Symptom Management, (25):376-385.

Levin, R. (1999) Cancer and the self: how illness constellates meaning. In: Health Studies: a Critical and Cross-Cultural Reader (ed. Samson C.). Blackwell, Oxford.

Lin,C., Chon, P., Wu, S., Chang, Y., Lia, Y. (2006) Long term effectiveness of patient and family pain education program on overcoming barriers to management of cancer pain. Pain, (122) : 271-281.

Lundorff, L., Peuckmann, V., Sjogren, P. (2008) Pain management of opioid-treated cancer patient in hospital setting in Denmark. Acta Anaesthesiol Scand,(52):137-142.

Mantyh,W., Wall and Melzack`s Textbook of Pain. Fifth Edition Ed. S.B. McMahon and M. Koltzenburg. 2006: Elsevier Churchill Livingstone.

Mazanec, P. (2001) Pain in advance cancer assessment and management. nursing forum,59-71.

McQuay, J. (1996) A systematic review of antidepressants in neuropathic pain. Pain, (68): 217- 227.

Mercadante, S. (1999) Pain treatment and outcomes for patients with advanced cancer who receive follow-up care at home. Cancer, (85): 1849-1858.

Mersky, H., Bogduk, N. Classification of Chronic Pain. (1994), Description of chronic pain syndromes and definition of pain terms. . 2. ed. ed. Seattle: IASP Press.

Neeman, Z.,Wood, J. (2002) Radiofrequency ablation beyond the liver. Tech. Vasc. Interv. Radiol, (5): 156-163.

Oliver, J., Kravitz, R., Keplans, S., Meyers, F. (2001) Individualized patient education and coaching to improve pain control among cancer patient. clinical oncology,(19): 2206-2212.

Orhan, E., Bilgin, F., Ergin, A., Dere, K., Guzeldemir, E. (2008) Pain treatment practice according to the WHO analgesic ladder in cancer patients: eight years experience of a single center. Agri, (20):38-44.

Pargeon, L., Hailey, J. (1999) Barriers to effective cancer pain management: A review of the literature. Journal of Pain Symptom Management, 18(5), 358-368.

Portenoy, K., Hagen, A. (1990) Breakthrough pain: definition, prevalence and characteristics. Pain, (41): 273-281.

Puntillo, A. (1991) Pain in the critically ill: assessment and management, ed. M.D. Gaithersburg: Aspen Publishers 255.

Randall, E., Wright, J., Porterfield, S., Lesser, G. (2003) Barriers to cancer pain management: home-health and hospice nurses and patients. Support Care Cancer, (11):660-665.

Rogers, L., Speiser, L., Ram, C. (1998) Efficacy and toxicity of intravenous strontium-89 for symptomatic osseous metastases. J. of Brachytherapy International, (14): 133-142.

Rogers, L., Speiser, L., Ram, C., (1998) Efficacy and toxicity of intravenous strontium-89 for symptomatic osseous metastases. Journal of Brachytherapy International, (14): 133-142.

Rousseau, P. (2001) The palliative use of high-dose corticosteroids in three terminally ill patients with pain. Am. J. Hosp. Palliate Care, (18): 343-346.

Rustøen, T. (2005) Age and the Experience of Chronic Pain: Differences in Health and Quality of Life Among Younger, Middle-Aged, and Older Adults. Clinical Journal of Pain, 21(6):513-523.

Sanchez, K., Vourlekis, B., Lee, J., Dwight, M., Lagomasino, I. (2005) Depression, correlates of depression, and receipt of depression care among low-income women with breast or gynecologic cancer. Journal of Clinical Oncology, (23):3052-3060.

PHYSICAL ACTIVITY AND CANCER PREVENTION: A REVIEW

Abstract

Introduction:
A number of lifestyle behaviors have already been discussed and reviewed as a risk factor for developing cancer, such as tobacco usage, diet, alcohol consumption, and obesity, so the purposes of this review are to:

(a) identify and review the literature on physical activity and cancer prevention intervention programs; and
(b) propose recommendations for community and for future research in physical activity and cancer prevention.

Method:
Search conducted on PubMed and Google for all English publications since 2005, with also classical references, using the following terminology: cancer, physical activity, and prevention.

Results:
It appears that the decreased risk of colon cancer, breast cancer, and lung cancer are associated with physical activity.

Conclusion and recommendation:
We can conclude that preventing different types of cancer is associated withincreased physical activity and being active, so enhancing physical activity among the population is recommended.

Key words: cancer, prevention, physical activity

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Introduction

Cancer still is a major health problem worldwide because of industrialization, changes in lifestyles, population growth and increase in proportion of elderly persons, despite advances for diagnosis and treatment (Joanna Kruk; Hassan Y., 2006). In 1922 the first finding that physical activity may prevent cancer disease was mooted. Two groups of researchers Cherry (1922), and Sivertsen and Dahlstrom (1922), reported

independently, that mortality rates on account of cancer in Australia, England and the United States, among men, reduced with increasing different types of physical activity.

Interest in physical activity as a means for the primary prevention of cancer is increasing because the evidence for its protective effect is accumulating. Together with dietary intake, healthy lifestyle and no tobacco use, physical activity may be one of the main risk factors for cancer that can be modified and changed by lifestyle/behavior modification and changes. There are different bodies of evidence which supports the existence of an inverse association between physical activity and cancer incidence. Lim and Taylor 2005 reported that in Australia and USA the costs of illness related to physically inactive persons were estimated high (colon cancer 19%, breast cancer 10%).

A lot of public health recommendations and health promotion programs have been developed for diet and tobacco that could, if adopted, result in an obvious decreased incidence of cancer in the world. Now a similar focus is directed toward the role of physical activity for reducing risk for some of the major cancer sites and types. Any factors that are related to the risk of developing cancer and can be used for preventive actions should be considered as of great value.

As cancer may take decades to develop, a long follow-up time is needed to identify enough cases to study the physical activity and cancer relationship so the purposes of this review are to:

(a) identify and review the literature on physical activity and cancer prevention intervention programs; and

(b) propose recommendations for community and for future research on physical activity and cancer prevention.

Materials and Method
Searches were conducted on Pubmed and Google for all publications in English since 2005, also classical references were taken into consideration. The search terms physical activity, exercise, cancer, and prevention, were used.

The literature search identified studies that covered different types of physical activity which related to the prevention of different types of cancer. This review focuses on the prevention of cancer so studies on the effects of physical activity after a diagnosis of cancer were excluded. Furthermore only prospective studies that used cancer as the outcome were included. Many papers and research were found according to that strategy and (10) were excluded based on assessment of the abstracts. Of the remaining (30), five papers were excluded after reading the full text.

Definition of physical activity

Physical activity is defined as a body movement produced by skeletal muscles that results in a quantifiable expenditure of energy (Caspersen et al., 1985). Physical activity includes occupational and leisure-time physical activities. The leisure time physical activity can be divided into: sports, conditioning exercises, household activity, self-care activity (e.g. bathing, dressing, talking, eating, sitting, standing), child-care activity and others.

Physical inactivity is a modifiable risk factor for cardiovascular disease and a widening variety of other chronic diseases, including diabetes mellitus, cancer (colon and breast), obesity, hypertension, bone and joint diseases (osteoporosis and osteoarthritis), and depression.

The World Health Organization (WHO) has found that there is convincing evidence that regular physical activity decreases the risk of weight gain and obesity, and sedentary lifestyles increase the risk. Being overweight or obese can increase the risk of developing cancers of the colorectum, kidney, pancreas, oesophagus and endometrium, as well as breast cancer in post-menopausal women. Excess body weight has also been linked with gallbladder and liver cancers.

It is not clear how physical activity protects against cancer. However, the following mechanisms may be involved, as physical activity can: reduce insulin and insulin-like growth factors, which can enhance tumour development by stimulating cell proliferation or inhibiting apoptosis, increase prostaglandin PGF, which acts as an inhibitor of colonic cell proliferation; lower the level of endogenous hormones such as oestrogens, which exert stimulatory effects on breast tissue, and can also reduce body fat, decrease systemic inflammation by lowering production of inflammatory cytokines, and enhance immune function by improving the function of natural killer cells, which have a role in tumour suppression, and decrease gut transit time, thereby reducing carcinogen exposure in the colon (McTiernan A.; Mechanisim linking physical activity with cancer, 2008).

Colon cancer

Colon cancer is one of the most common incident cancers, and the second most common cause of cancer death in the USA.

A number of dietary factors have been associated with colorectal cancer risk. It has been proposed that fruit and vegetables decrease risk and preservatives and red meat increased risk (key et al, 2004). Also overweight and obesity increase the risk for colorectal cancer.

Old studies conducted in the late eighties found a significantly reduced risk of colon cancer among active persons; the average of this risk reduction was 40%-50% (Gerhardson, M et al. 1986.; Wu, A. H. et al. 1987.; Vena, J. et al. 1987; Lynge, E. et al. 1988.).

In a recent population-based study of Lee et al. (2007) of 65,022 Japanese men a significant inverse correlation effect between the level of physical activity (time spent daily on heavy physical work or walking and standing) and the risk of developing colorectal cancer was found among men, only. Also,

the authors observed a strong risk reduction in men for colon cancer and for proximal colon cancer. As mentioned by the Agency for Healthcare Research and Quality in 2007, there is a very solid and strong evidence of preventing colon cancer by physical activity and being active. In 2002 Friedenreich et al suggested that active persons have a relative risk for colon cancer of approximately 0.5-0.6 compared with sedentary persons. Furthermore, a review conducted by L. Miles (2007) highlighted the association between physical activity and the risk of colon cancer in populations in Asia, Europe and USA. The author found that the magnitude of reducing risk was approximately 40% and a 30-60 minutes daily of moderate intensity physical activity is needed to have the greatest effect in reducing the risk of colon cancer. Lund Nilsen and Vatten (2002) found a significant inverse association between physical activity and colorectal cancer in men but not in women. Thune I, Furberg AS, (2001) reported that routine physical activity, whether it is a part of the job or a leisure activity, is associated with reducing the incidence of colon cancer.

As reported by the World Cancer Research Fund and American Institute for Cancer Research 2007, there is strong epidemiological evidence that an association between physical activity and colon cancer exists, with convincing evidence from numerous studies that not doing enough physical activity can increase risk.

Breast cancer

As high lifetime exposure to estrogen is known to be a risk factor for breast cancer, non-parity, early menarche and late menopause all increase breast cancer risk. It is thought that physical activity modifies risk of breast cancer as a result of its effects on estrogen levels and estrogenic processes.

Girls who are active tend to begin menstruation later than those who are less active; menstrual disturbances with endurance

exercise are also well documented (Westerlind 2003). There is also some evidence that even active women who have normal cycles have lower plasma concentrations of estrogen than sedentary controls (Hardman 2001). Moradi et al, (2002) found no association between breast cancer and physical Activity, but a higher risk reduction was discovered in a case-control study in Kuala Lumpur (Malaysia), done by Kamarudin et al (2006). In their study women who did not exercise regularly have 3.5 times higher risk of having breast cancer in comparison to those women who exercised regularly. Also, the authors of a population-based case-control study of Polish women (Anderson et al., 2007) reported increases by 35% for women whose average lifetime physical activity was low, compared with those who were physically active.

In the California Teachers Study by Dallal et al. (2007) the authors observed a linear decrease in the risk of breast cancer with increasing amounts of physical activity.

Furthermore, in a cohort study of women in nine European countries conducted by Petra H. et al. (2007), women aged 20 to 80 years, showed that increased non-occupational physical activity and increased household activity were significantly associated with reduced risk of breast cancer.

In 2002 Friedenreich et al suggested that females who exercise for 3-4 hours/week at moderate intensity or more, have a 30-40% reduced risk for breast cancer compared with sedentary women. Bernstein, L. et al (2005) and MeTiernan, A. et al (2003) found a moderate effect of reducing the risk of having breast cancer, in the order of a 20% risk reduction with the equivalent of walking approximately 45-60 minutes/day, 5-6 days/week.

A systematic review in 2007 reported an inverse association between physical activity and post-menopausal breast cancer with risk reduction ranging between 20% to 80%, but it was much weaker for pre-menopausal breast cancer (Monninkhof EM, Elias SG et al, 2007).

Lung cancer

Airway obstruction increases lung cancer risk, so even after taking cigarette smoking into account, increased pulmonary function following high levels of physical activity could result in decreased opportunity for airway exposure to inhaled carcinogens (Tardon et al. 2005).

A study by Kubik et al (2004) conducted among Czech women (419 cases, 1593 controls) found a reduction in lung cancer risk only among physically active smokers.

Also, researchers from Canada (Mao et al, 2003) reported that risk reduction associated with physical activity was more profound among smokers.

Bak et al (2006) reported that more vigorous activities were associated with reduced risk of having lung cancer. Thune I, Furberg AS, (2001) reported that routine physical activity whether it is a part of the job or a leisure activity, is associated with reducing the incidence of lung cancer.

Discussion

This review presents the most recent findings on the association between physical activities and cancer prevention. According to this review; colon cancer and breast cancer have been the most recognized as those in which risk is decreased by physical activity, but regarding lung cancer it is now apparent that the risk of it developing is likely to be decreased by physical activity, because of the few papers found as evidence for it.

It appears that colon cancer risk can be reduced among men who are physically active. A recent study of

Lee et al (2007) found a significant inverse correlation effect between the level of physical activity and the risk of developing colorectal cancer among men, and also the link between breast cancer and physical activity is stronger in post-menopausal women rather than pre-menopausal, as mentioned in a systematic review in 2007 which reported an inverse association between physical activity and post-menopausal breast cancer with risk reduction ranges between 20% to 80%, but it was much weaker for pre-menopausal breast cancer (Monninkhof EM, Elias SG et al, 2007).

Most of the studies which were reviewed in this paper, reported that physical activity has an inverse ratio between physical activity and developing cancer, especially colon cancer and breast cancer.

The relationship between breast cancer and physical activity has been the subject of studies several years ago and reviewed many times since 1998 by Gommon et al. Over these years, the studies which support an inverse association between breast cancer and physical activity is increasing and supporting the same association.

In this review a strong relationship between physical activity and colon cancer was reviewed from different studies in both men and women.

One of the most important limitations, was that there was not enough papers discussing the association between physical activity and other cancer sites rather than breast and colon cancer.

Recommendation

The evidence for a protective role of physical activity in cancer etiology is accumulating and increasing. Lack of time and environmental factors such as urban location and climate/season are associated with lower physical activity levels.

Improving health and fitness are two common motivating factors for exercise. In addition, social support, access to facilities and neighborhood safety have all been positively associated with increased levels of physical activity.

Recently, motivation for adults to do more exercise may have been influenced by increased media coverage on physical activity and body weight between 2001 and 2004, as well as changes to the way people commute to work e.g. higher petrol prices leading to the decreased use of cars and increased walking, cycling and use of public transport.

For some cancer sites, such as colon and breast, high level of physical activity and long duration are recommended (from 30-60 min daily of moderate to vigorous intensity (Lee, 2003). Healthy behaviors can affect cancer incidence and death rates; therefore it is important to recognize the factors influencing these behaviors.

The Cancer council supports and encourages the National Physical Guidelines (2006), which recommends the population to think of movement as an opportunity not an inconvenience, to be active every day, to put in at least 30 minutes of moderate intensity physical activity, and to try to take some regular vigorous exercises.

It is also recommended for inactive people to increase their physical activity which is more beneficial. The population should be encouraged to be active every day as much as they can, because it can help in increasing the total amount of energy burnt, which helps in maintaining a healthy body weight and reducing cancer risk.

In conclusion, with a high prevalence of individuals being lazy and sedentary, and With cancer incidence increasing there is a major need to undertake more research on the relationship between physical activity and cancer in order to identify the type of physical activity, the intensity, duration, and frequency of occurrence, and its importance in the prevalence of different cancer sites.

References

1. Anderson WF, Matsuno RK, Sherman ME, et al (2007). Estimating age-specific breast cancer risk: a descriptive tool to identify age interactions. Cancer Causes Control, DOI 10.1007/s 10552-006-0092-9.

2. Dallal CM, Sullivan-Halley J, Ross RK, et al (2007). Longterm recreational physical activity and risk of invasive and in situ breast cancer: the California teachers study. Arch Intern Med, 167, 408-15.

3. Kamarudin R, Shah SA, Hidayach N (2006). Lifestyle factors and breast cancer : a case-control study in Kuala Lumpur, Malaysia. Asian Pac J Cancer Prev, 7, 51-4.

4. Lee K-J, Inoue M, Otani T, et al. for the JPHC Study Group (2007). Physical activity and risk of colorectal cancer in Japanese men and women: the Japan Public Health Centerbased prospective Study. Cancer Causes Control, 18,199-209.

5. Petra H, Christine Friedenreich, et al (2007). Physical activity and breast cancer risk: the European prospective investigation into cancer and nutrition. Cancer Epidemiol Biomarkers Prev, 16(1).

6. Caspersen CJ, Powell K, Christenson GH (1985). Physical activity, exercise, and physical fitness: definition and distinctions for health related research. Public Health Rep, 100, 126-31.

7. Agency for Healthcare Research and Quality. Guide to clinical prevention services, 2007. Rockville (MD): US Preventive Service Task Force.

8. Friedenreich, C. M. Orenstein, M. R. (2002) Physical activity and cancer prevention: etiologic evidence and biologic mechanism. J Nutr. 132, 3456S-34645.

9. Cherry TA (1922). A theory of cancer. Med J AUST, 1, 425-438.

10. Sivertsen I, Dahlstorm AW (1922). The relation of muscular activity to carcinoma. A preliminary report. J Cancer Res, 6, 365-78.

11. Lee IM, Sesso HD, Oguma Y, Paffenbarger RS (2003). Relative intensity of physical activity and risk of coronary heart disease. Circulation, 107, 1110-6.

12. Miles L. (2007) Physical activity and the prevention of cancer: a review of recent findings. Nutrition Bulletin, 32, 250-282.

13. Lund Nilsen TI. And Vatten LJ. (2002). Colorectal cancer associated with BMI, physical activity, diabetes, and blood glucose. IACR Scientific Publications. 156, 257-8.

14. Westerlind KC (2003). Physical activity and cancer prevention mechanism. Medicine and Science in Sports and Exercises. 35:1834-40. 13

15. Hardman AE (2001) Physical activity and cancer risk. Proceedings of the Nutrition Society. 60: 107-13.

16. Bak H, Christensen J, Lykke Thomson B, et al. (2005) Physical activity and risk of lung cancer in a Danish cohort. International Journal of Cancer. 116: 439-45.

17. Tadron A, Lee WJ, Delgado-Rodriguez M et al, (2005) leisure-time physical activity and lung cancer: a meta-analysis. Cancer Causes and Control. 16: 389-97.

18. Thune I, Furbeng AS. (2001). Physical activity and cancer risk: dose response and cancer, all sites and site-specific. Med Sci Sports Exer: 33: S530-50.

19. Taylor RS, Brown A, Ebrahim S, et al (2004). Exercise-based rehabilitation for patients with chronic disease: systematic review and meta-analysis of randomized controlled trials. Am J Med. 116: 682-92.

20. Monninkhof EM, Elias SG, Vlems FA, et al (2007). Physical activity and breast cancer. Epidemiology. 18(1): 137-157.

21. World Cancer Research Fund and American Institute for Cancer Research. Food, nutrition, physical activity and the prevention of cancer: a global perspective. Washington DC: AICR. 2007.

PRESSURE ULCER ASSESSMENT AND PREVENTION IN ONCOLOGY SETTINGS: A REVIEW

Abstract

Background: Pressure ulcer is a major complicated clinical problem caused by multi-factorial etiology. It is associated with many risk factors that are quite similar to the signs and symptoms of oncological disorders. Pressure ulcer can impact patients' quality of life in many aspects. A patient might die from pressure ulcer rather than cancer itself.

Significance: Preventing pressure ulcers from occurrence might bring a great positive impact on the whole health care system in many aspects, including socially and economically.

Purpose: The purpose of this review is to collect the best evidence on pressure ulcers in order to assist nurses in being able to define, assess, stage and prevent their occurrence.

Methods: Relevant research concerning pressure ulcer assessment and prevention in oncology patients was identified by searching the medical and nursing sciences databases for primary research material.

Results: There is general consensus on definition and staging of pressure ulcers in different settings and locations, while assessment and prevention remain open for further research and studies based on available resources, training and patients' characteristics.

Conclusion: Developing a program or protocol for early assessment and prevention of pressure ulcer has a major impact in reducing its incidence and improving the outcome of oncology patients.

Key Words: Pressure Ulcer, assessment, prevention,

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Introduction and Background

Skin is the largest organ of the human body. It contributes in many structural processes and functional responsibilities. Skin has major roles in maintaining body temperature, defending against different types of germs, interacting with the surrounding environment to enable nervous system to recognize heat, cold, pain and touch. Skin is very important, and needs all kinds of care and attention to maintain its functionality, while any break down in its function might put our patients at risk for injury and disease (Romanelli, Clark, Cherry, Colin & Defloor, 2006).

Pressure ulcers (PU) are a major complicated clinical problem, anticipated by a multifactorial etiology. Nationally and internationally, pressure ulcers have been recognized as a major complication of patient's admission to hospitals and health care facilities (Elliott, McKinley & Fox, 2008), and it is considered as a major drain on health resources that can cause severe illness or disruption to life (Romanelli et al., 2006). Since incidence of pressure ulcer has an important influence on the patient's quality of life in many aspects; it is a part of a nurse's work to assist patients with their physical, spiritual, and social needs if patients are unable to satisfy these needs on their own (Romanelli et al., 2006). Actually it should be considered as an essential part of nurses' roles in close collaboration with other helath care providers such as physicians,

nutritionists and surgeons. The Joint Commission of the International Accreditation (JCIA) has set prevention of pressure ulcers as a primary goal (Kirby & Gunter, 2008), so nursing staff's motivation, competence, and skills in effective methods, influence the success of the preventive and assessment measures.

Methodology

Relevant research concerning pressure ulcer assessment and prevention in oncology patients was identified by searching the medical and nursing sciences databases for primary research material. A total of (6) research databases were searched for publications from 2005 through to the present (2010), with key articles obtained primarily from MEDLINE, HINARY, Ovidsp, MedScape, EBSCO, and Science Direct research databases. In order to ensure that relevant studies were not missed, the search terms remained broad. These were "pressure ulcer", plus "oncology", plus "assessment", plus "prevention" anywhere in the title or abstract, limited to English language. Studies were eligible for consideration in this review if: (a) the focus of the study was adult population, (b) written in English, (c) full text articles, (d) any research article published after 2005. Studies were excluded if the population was in children, if the article was published before 2005, and if it is not a full text article.

Objectives

The main purpose of this paper is to find out the best knowledge to define, to stage, to assess and to prevent pressure ulcers in patients with cancer. It has been proven that developing the pressure ulcer prevention guidelines will contribute to prevalence reduced by more than 50% (Elliott, 2008; Catania et al., 2007). So my focus in this paper will be on discussing recent work and efforts on pressure ulcer assessment, prevention, and concentrating on the best evidence based practices regarding this issue that can be applied in oncology care settings, as it might be inferred by other definitions (e.g. LTC). It is important to state that this paper is not intended to discuss the etiology of pressure ulcers. It neither discusses their pathophysiology nor their treatment modalities.

Significance

As oncology nursing is improving and developing in Jordan, and as many hospitals are adopting the (JCIA) standards in nursing quality indicators, pressure ulcers should become a primary goal as an indicator for quality of nursing care in oncology settings and perhaps in all health care settings. On the other hand, this will improve the patient's life style and will have economical and social benefits to nursing and the health care system in Jordan.

Literature Review

Definitions

The EPUAP (The European Pressure Ulcer Advisory Panel) and the NPUAP (The National Pressure Ulcer Advisory Panel) are independent, non-profit organizations dedicated to the prevention, assessment and management of pressure ulcers in Europe and in the USA. They define pressure ulcer as an area of "localized damage to the skin and underlying tissue caused by pressure, shear, friction and/or a combination of these" (Plaum, Riemer & Froslie, 2006), and as "localized areas of tissue necrosis that develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time" (Catania, Huang, James, Madison, Moran & Ohr, 2007). These two major definitions for pressure ulcer are not different from each other in the main concept, which is loss of perfusion to a localized area of skin because of different kinds of pressure forces.

There were four years of collaborative research, studies and meetings between these two giant organizations to unify their definition for pressure ulcers. They use a consensus of an international NPUAP-EPUAP definition for pressure ulcer as "it is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear" (EPUAP, 2009; NPUAP, 2009). This definition has been adopted by many of the institutions and big organizations to quality-control the concept and to reduce its related redundancy. NDNQI (National Database of Nursing Quality Indicators), a program of American Nurses Association's (ANA) National Center for Nursing Quality, has adopted the pressure ulcer definition by the NPUAP and designed a four-module curriculum, namely Pressure Ulcer Training, in order to teach nurses how to assess, prevent and manage pressure ulcers. For the purposes of counting, tracking and managing quality statistics; Prevalence and incidence are two different measures that can be used (Catania et al., 2007). Since pressure is the major physiologic factor that leads to soft-tissue destruction, it is preferred to use the term pressure ulcer rather than the classical well known terms such as decubitus ulcer or bed sore. It gives a false inference linking it to stay-in-bed or decubitus positions as the only etiological factors, and may indirectly assume that only lack of nursing interventions such as turning patients can be contributed to the development of pressure ulcers (Reilly et al., 2007).

There are no different, more specialized definitions to pressure ulcer that can differentiate oncology patients from other patients in different settings. In fact most of the literature that has been reviewed in this paper has identified long-term care (LTC) patients, in which cancer patients and palliative care patients can be included.

Epidemiology of Pressure Ulcers

Some pressure ulcers can be present with patients upon their admission to hospitals, while others are associated as an adverse outcome from their stay in hospital. So, pressure ulcers are considered a significant and increasing source of suffering of pain, social isolation and financial burden on patients and the health care system (Reilly et al., 2007; Hart, Berquist, Gajewski & Dunton, 2006). The incidence and prevalence rates of pressure ulcers are different from one hospital to another and from one country to another. In 2008, International Health Care Publications report incidence rates of 1% to 11% and prevalence rates of 3% to 22% in hospitalized patients. The rates are higher in critical care patients; with incidence 5.2%-20% and prevalence 14.4% (Elliott, McKinley & Fox, 2008). The NPUAP (2007) found a pressure ulcer incidence rate in acute care settings of 0.4% to 38% (Kirby & Gunter, 2008, Catania et al., 2007). In addition, about 57-60% of all pressure ulcers occur within hospitals. Up to 13% of patients develop pressure sores as an outcome of being admitted to Intensive Care Units (ICU), mainly due to the associated multiple risk factors for critically ill patients to develop pressure ulcers (Shahin, Dassen, Halfens & Ruud, 2008).

Risk Factors / Population at Risk

The risk factors associated with pressure ulcers are different, including medical diagnoses, co-morbidities and previous medical events such as fractured hip, diabetes or impaired sensation; patient demographic characteristics (e.g. old age); anthropometric characteristics such as increased body mass index; physiological status (e.g. increased body temperature, glucose levels, tissue

perfusion, etc.); nutritional status including low serum albumin, poor dietary and protein intake; functional status like inability to control bladder and bowel function, immobility; cognition (e.g. levels of consciousness); psychological status (e.g. stress); knowledge and adherence, and nursing care facility characteristics (available registered nurses and assistant time, size or location of facility) (Reilly et al., 2007; Plaum, Riemer & Froslie,2006; Romanelli et al., 2006). Several factors increase the risk: greater severity of illness; increased length of stay; poor tissue perfusion due to hemodynamic instability, limited positioning, impaired ventilation resulting in reduced tissue oxygenation, the use of vasoactive medications and anemia; pressure caused by nasogastric or endotracheal tubes; and physical restraints also may directly cause pressure ulcers (Shahin, Dassen & Halfens, 2009; Reilly et al., 2007). These critically ill patients are generally vulnerable and not able to care for themselves or to react accordingly, because they receive sedation, analgesics, or muscle relaxants (Elliott, McKinley & Fox, 2008; De Laat et al., 2007).

Assessment and Assessment Scales

The first step in preventing pressure ulcers is to know exactly how to assess them in an accurate, precise manner. When and how many times to do the risk assessment varies according to the patient's health status and their priorities; the acute care patients should be assessed on admission, and then reassessed at least every forty-eight hours, while ICU patients whose condition is stable should be reassessed daily; assessment should be more frequent for those whose condition is unstable, thus requiring assessment at every shift (Stevenson, 2009).

Various pressure ulcer risk scales have been developed to determine at-risk patients who might develop a pressure ulcer. Over the past twenty to thirty years, many of these scales have been implemented,

with the Norton, Waterlow scale, the Jackson/Cubbin risk scale, and the Skin Ulcer Risk Evaluation (SURE) (Magnan & Maklebust, 2008; Reilly et al., 2007).

Theoretically, the perfect scale should be easy to use, reliable, and validated in prospective studies, while the consequences in terms of preventive measures should be cost-effective. Unfortunately, the validity and reliability of many scales are yet questionable, and no agreement exists regarding these scales (Romanelli et al., 2006). The Braden Scale is the most studied and most commonly used pressure ulcer risk assessment tool in the United States and in Jordan. It consists of six subscales: sensory perception, moisture, activity, mobility, nutrition, and friction and shear. Each subscale contains a numerical range of scores (1 to 4 on the first five subscales mentioned above and 1 to 3 on the friction and shear subscale) with 1 being the lowest possible score and reflecting the highest risk. The overall Braden Scale score is obtained by adding the individual numeric ratings from each of the six subscales, resulting in a score between 6 and 23. A score of 18 or less is considered predictive of pressure ulcer development unless preventive actions are taken; the lower the score, the higher the patient's risk of developing a pressure ulcer (Magnan & Maklebust, 2008; Catania et al., 2007).

One disadvantage of these scales is that there is no consensus on these scales' cut-off scores, meaning there are no clear indications that at-risk patients will develop pressure ulcers and whether prevention measures should be instituted or not (Magnan & Maklebust, 2008; Romanelli et al., 2006). This means that sometimes prevention measures are applied to patients who don't need them or alternatively they are not applied to more vulnerable patients (Romanelli et al., 2006). As it might be noticed, assessment scales are beneficial for standardized care and universal protocols usage, while every patient should be assessed, treated and

managed on an individualized basis. Pressure ulcer etiology would certainly be different from one patient to another, therefore more detailed specific anticipating factors should be looked for.

Classification of Pressure Ulcers

Pressure ulcers can be categorized into stages according to the anatomical tissue depth and extent of skin damage. The most common staging system was defined by Darrell Shea, an orthopedic surgeon in 1975, and later it was refined by the NPUAP (2007).

Stage (I) pressure ulcer is defined as intact skin with non-blanchable redness of a localized area that is warmer or cooler to touch and the erythematic area does not resolve within 2 hours. Stage (II) is a partial thickness loss of epidermis, dermis or both presenting as a shallow open ulcer with a red pink wound bed, without slough. It may also present as an intact or open/ruptured serum-filled blister. Stage (III) is a full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscles are not exposed. Slough may be present but does not obscure the depth of tissue loss. Stage (IV) is a full thickness tissue loss with exposed bone, tendon or muscle. Sometimes pressure ulcer cannot be staged; non-stageable pressure ulcer is a full thickness tissue loss in which the base of the ulcer is covered by slough and/or eschar in the wound bed. (Hulsenboom, Bours & Halfens, 2007; Romanelli et al., 2006).

Prevention of Pressure Ulcers

Preventing pressure ulcers should be a nursing initiative. Since after the patient's admission, the first care giver would be a nurse, who would be able to assess the patient systematically and thoroughly. Nursing staff are the center of care for any patient within a certain facility. The challenge is more difficult when there is nursing staff turnover and shortages. Studies have suggested that pressure ulcer development can be directly affected

by the number of registered nurses and time spent at the bedside (Romanelli et al., 2006). As length of stay is known to be an independent predictor for pressure ulcers in critically ill patients; it is not expected to be able to prevent pressure ulcers in all patients. However, it is expected to be able to decrease the pressure ulcer frequency and to prolong the average time until a pressure ulcer appears (De Laat et al., 2007). There is good evidence to support the impression that many pressure ulcers are preventable. Three general guidelines for pressure ulcer prevention involve; identification of patients at higher risk for developing ulcers, preventive measures appropriate for the level of risk, and close follow up with frequent reassessment whenever the patient's status deteriorates (Reilly et al., 2007).

Skin care

It is important to maintain personal hygiene, keeping the skin clean and dry, and minimizing factors that cause dryness, such as low ambient humidity. Moisturizing lotions should be used to prevent dryness and cracking of the skin. On the other hand, it is important to minimize exposure of the skin to moisture from incontinence or wound drainage. Assess and treat causes of urinary and fecal incontinence and provide opportunities for bowel and bladder training when appropriate; if not appropriate consider Foley's catheter (Hulsenboom, Bours & Halfens, 2007; Romanelli et al., 2006).

Massaging over bony prominences should be avoided. It was believed that massaging the bony prominences promoted circulation. However, postmortem biopsies found degenerated tissue in those areas exposed to massage (Hulsenboom, Bours & Halfens, 2007).

Positioning

It is generally regarded as one of the most important and most effective measures for preventing pus. By regularly positioning patients in a different position, one modifies "the pressure points"; the points on which the body is supported. If the position is modified frequently enough and the oxygen shortage in the tissues does not last too long, the chance of developing pressure ulcers is limited. The standard method is turning the patient at least every 2 to 3 hours (Reilly et al., 2007; Romanelli et al., 2006). In the flat supine lying position and in a semi-Fowler's position of 30°, the pressure would be lowest and thus the risk of pressure ulcers, smallest. Pillows are used to support the patient at a 30° lateral position, to prevent prolonged pressure and relieve the amount of pressure on bony prominences; the frequently neglected areas (Hulsenboom, Bours & Halfens, 2007; Reilly et al., 2007; Romanelli et al., 2006).

Mechanical offloading

The use of lifting devices, such as bed linen, to move the person in bed will also decrease the potential for friction and shear forces. As the amount of shear increases, the amount of pressure required to cause pressure ulcers is reduced, and this will lead to the tissue being dragged from its attachment to the bone. Eventually the friction can arise when the skin is rubbed against a rough surface (Hulsenboom, Bours & Halfens, 2007).

Support surfaces

The prosperities of support surface, including life expectancy of the surface, pressure redistribution, effectiveness of skin moisture and temperature control, product service requirements, should be studied uniformly in tests of such surfaces (Romanelli et al., 2006). Pressure redistribution can be divided into two main classes: reactive surfaces and active surfaces. Reactive surfaces include all static surfaces, constant low-pressure devices, air-fluidized and static gels (Reilly et al., 2007). Reactive refers to the ability of the surface to support as large an area of the patient as possible, thus reducing the contact between patient and surface or interface pressure. Active surfaces include alternating pressure and dynamic surfaces, which cyclically deflate and inflate over the surface of the device resulting in partial or complete relief of pressure for short periods of time (EPUAP, 2009; NPUAP, 2009).

Encouraging optimal nutrition and fluid intake; evaluating nutritional status, considering resident preferences and special needs, providing assistance and adequate time, offering snacks and fluids between meals, considering administration of vitamin and / or protein supplements, considering tube feeding / parenteral fluids per resident choice and assessing laboratory data that may indicate nutritional status (i.e., CBC, albumin, prealbumin, transferrin levels) are required. (Hulsenboom, Bours & Halfens, 2007).

Discussion and Conclusion
Nursing Implications

Pressure ulcers are a forgotten underlying cause of multi complications and diseases. It will always be considered as a major health complication that might stamp the outcome of health care institutions. It is associated with patients getting worse or becoming unresponsive to medication regimens, since we tend not to examine them thoroughly or since we are more involved in treating and managing the more obvious signs and symptoms. The incidence rates of pressure ulcer are as high as cancer incidence rates, reaching to 1.3 million in 2005 in USA (Lyder, 2006). In Jordan, those rates for pressure ulcers are unknown, since they are neglected, unrecorded or simply missed from being considered.

The risk factors associated with developing pressure ulcers are typically the major signs and symptoms of being diagnosed with cancer; Immunosuppression, fatigue and poor nutrition (Lyder, 2006). Pressure ulcer prevention starts with the proper assessment initiated by an expert, or a well trained nurse who will be able to identify the patient who is at risk, and will have the motivation and the attitude to

utilize the resources and the optimal measures in order to advocate and protect patient from this complication.

The author noticed that selecting an appropriate training program with a standardized consensus on defining pressure ulcer, its relative risk factors, a well defined staging system and proper treatment regimes should absolutely contribute to winning the fight against a major leading cause of serious health complications and illnesses; pressure ulcers. Being able to stage pressure ulcers, then to reverse that to reach total cure and returning skin to its normal shape and structure will mean a lot to the patient and to the whole health care system. The author believes that success can be attributed to the nursing discipline in a certain institution if they are to achieve 0% rate of pressure ulcer incidence. This is not away from being achieved. Nursing staffs' attitude toward their patients, and being their advocate, is a primary motivation toward such achievement.

References

Catania K., H. C. (2007). PUPPI: The Pressure Ulcer Prevention Interventions. One Hospital's Quality-Improvement Initiatives Reduces Pressure Ulcer Prevalence. AJN , 107 (4), 44-52.

De Laat, E. H., Pickkers, P., Schoonhoven, L., Verbeek, A. L., Feuth, T., & Van Achterberg, T. (2007). Guidelines Implementation Results in a Decrease of Pressure Ulcer Incidence in Critically Ill Patients. Crit Care Med , 35 (3), 815-820.

Elliott, R., Mckinley, S., & Fox, V. (2008). Quality Improvement Program to Reduce the Prevalence of Pressure Ulcers in an Intensive Care Unit. AJCC , 17 (4), 328-334.

European Pressure Ulcer Advisory Pannel and National Pressure Ulcer Advisory. (2009). Prevention and Treatment of Pressure Ulcers: Quick Refuide. National Pressure Ulcer Advisory .

Hart, S., Bergquist, S., Gajewski, B., & Dunton, N. (2006). Relaibility Testing of the National Database of Nursing Quality Indicators Pressure Ulcer Indicator. Journal of Nursing Care Quality , 21 (3), 256-265.

Hulsenboom, M. A., Bours, G., &

Halfens, R. (2007). Knowledge of Pressure Ulcer Prevention: a Cross-Sectional and Comparative Study Among Nurses. BMC Nursing , 6 (2).

Kirby, J. P., & Gunter, O. L. (2008). Prevention and Treatment of Pressure Ulcers in the Surgical Intensive Care Unit. Current Opinion in Critical Care , 14, 428-431.

Lyder, C. (2006). Assessing Risk and Preventing Pressure Ulcers in Patients With Cancer. Seminars in Oncology Nursing , 22 (3), 178-184.

Magnan, M. A., & Maklebust, J. (2008). The Effect of Web-Based Braden Scale Training pn Reliability and Precision of Braden Scale Pressure Ulcer Risk Assessment. Journal of Wound Ostomy Continence Nursing , 35 (2), 199-208.

Plaum, P., Riemer, G., & Frosile, K. F. (2006). Risk Factors for Pressure Sores in Adult Patients with Myelomeningocele: A Questionnaire-Based Study. BioMed Central , 3 (14).

Reilly, E. F., Karakousis, G., Schrag, S. P., & Stawicki, S. P. (2007). Pressure Ulcers in the Intensive Care Unit: The 'Forgotten" Enemy. OPUS , 1 (2), 17-30.

Romanelli M., C. M. (2006). Science and Practice of Pressure Ulcer Management. London: Springer-Verlag London Limited 2006, Library of Congress.

Shahin, E. S., Dassen, T., & Halfens, R. J. (2009). Incidence, Prevention and Treatment of Pressure Ulcers in Intensive Care Patients: a Longitudinal Study. International Journal of Nursing Studies , 46, 413-421.

Stevenson, K. (2009). Pressure Ulcer Prevention: When are we Negligent? Wound Care Canada , 7 (2), 30-32.

Schumacher, L., West, C., Dodd, M., Paul, M., Tripathy, D., Koo, P. (2002) Pain management autobiographies and reluctance to use opioids for cancer pain management. Cancer Nurses, (25):125-133.

Smith, M., Duhamel, K., Egert, J., Wiukel, G. (2010) Impact of brief management on patient compliance and barrier to pain management: randomized control trail. Patient education and counseling, (81):86-97.

Thomas, M., Elliott, J., Douglas, M., Gold, J. (2005) exploring the relationships between cancer pain, attitudinal barriers, and PTSD: a descriptive study. Oncology Nursing Forum, (32):429.

Thompson, T., Keogh, E., French, C., Davis, R. (2008) Anxiety sensitivity and pain : generalizibility across noxious stimuli. Pain,(134):187-196.

Valeberg, B., (2009) Pain , barriers to pain management in outpatient with cancer 1-70.

Vallerand, H., Hasenau, S., Templin, T., Collins, D. (2005) Disparities between black and white patients with cancer pain: the effect of perception of control over pain. Pain Med, (6): 242-250.

Ward, E. (1993) Patient-related barriers to management of cancer pain. Pain, 52(3) : 319-324.

Weiss, C., Emanuel, L., Fairclough, L., Emanuel, J. (2001) Understanding the experience of pain in terminally ill patients. Lancet, 357(9265): 1311-1315.

Wong, R., Wiffen, J. (2002) Bisphosphonates for the relief of pain secondary to bone metastases Cochrane Review. Cochrane Database Syst Rev (2):CD00208.

Yates, P., Edward, H., Nash, R., Walsh, M., Fentiman, J., Skerman, H., Najman, J. (2002) Barrier to effective cancer pain management in hospitalized cancer patient in Australia. pain and symptom management , 32 (5): 393-405

Yildirim, Y., Clcek, F., Uyar, M. (2009) Effect of pain education program on pain intensity, pain treatment, satisfaction, and barrier in Turkish cancer patient. Pain management nursing,10 (4) 220-228.

Zech, F. (1995) Validation of World Health Organization Guidelines for cancer pain relief: a 10-year prospective study. Pain, (63): 65-76.

22. McTiernan A. Mechanisms linking physical activity with cancer. Nat Rev Cancer. 2008; 8(3): 205-211.

23. Key TJ, Schatazkin A, Willett W, et al. (2004) Diet, nutrition and prevention of cancer. Public Health Nutrition. 7: 187-200.

24. Lim K, Taylor L (2005). Factors associated with physical activity among older people. Prev Med. 40, 33-40.

25. Commonwealth Department of Health and Aged care (2006). National Physical Activity Guidelines for Adults. Medical association. 174: 801-806.

26. Gammon MD, John EM and Britton JA (1998). Recreational and occupational physical activity and breast cancer. Journal of the National Cancer Institute. 90, 100-177.

PARENT'S EDUCATION AND ITS IMPACT ON CHILD MORTALITY: A CASE STUDY AT THAKURGAON DISTRICT IN BANGLADESH

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Abstract

Child mortality is the sensitive index of development and often reflects a country's quality of life. Mortality is a biological process and child mortality is a current important issue in our country, but there is little understanding of whether Bangladesh will be capable of achieving all of the Millennium Development Goals, especially child mortality. For this we have collected information from 500 respondents with a questionnaire to estimate the parent's Education and its impact on Child Mortality. The purpose of this study is to investigate the differential patterns and influencing factors on various socio-economic and demographic variables especially education, that have an effect on child mortality. To identify the effect and statistical significance we have used statistical techniques and multivariate analysis, named path analysis. The present study shows that some of these selected factors significantly affect child mortality. These factors are educational status of women, monthly income, age at first marriage, medical checkups during pregnancy and type of delivery.

Key Words: **Parental education, Child Mortality, Bangladesh**

Introduction

The study of child mortality is one of the most important research topics of developing countries like Bangladesh. There are two major reasons behind this:

(i) the high level of infant and child mortality and

(ii) its relationship with parent's education. The reduction of infant and child mortality indirectly helps in reducing fertility by decreasing the desired number of children to be born, due to increased probability of survival of a child. Child mortality is a composite index reflecting environmental, social, economic, health care services and delivery situations on the one hand, and maternal, as well as family and community norms and practices on the other (Mosely, W.H. and L.C. Chen (1984)).

Child mortality has traditionally been viewed as an indicator of social and economic well-being. Child mortality in Bangladesh has long been a topic of interest to population researchers because of its apparent relationship with fertility, education and indirectly with the acceptance of modern contraception. The decline in mortality may be attributed to the Government's efforts to implement a public health programme, including the immunization of children. Successive five-year national development plans have been emphasizing reductions in infant and child mortality, with varying targets (Arifeen,S.E. 2008). This emphasis has been reflected in increased budgetary allocations for the health sector as well as the development of infrastructure at the lowest administrative level, such as health and family welfare center's and the establishment of satellite clinics in outreach areas. In addition, large numbers of non-governmental organizations (NGOs) have also been active in the areas of health, education and family planning. However, despite all these efforts, health care facilities in Bangladesh remain limited and inadequate; besides a lack of health personnel, medicines and other facilities are not uniformly available.

Various factors influence the levels of child mortality. For instance, childhood illness and death are much higher in the poorer strata of society (UN, 1991). Illiteracy of mothers, culturally determined attitudes with respect to health and medical care, lack of basic knowledge and awareness of health problems, poverty and the inaccessibility of health facilities, all contribute to these high rates. Education of women, awareness of the importance of hygiene, the use of techniques such as oral dehydration therapy (ORT) in managing diarrhoea, and the importance of timely immunization are factors that could save the lives of many children. research on child mortality and parent's education is increasingly oriented towards the measurement of the direct and indirect effects of different socio-economic and demographic variables and the interpretation of specific relationships. Numerous factors are correlates of child survival.

In terms of these effects, the factors that have received the most attention are maternal education, sanitation, access to safe drinking water and maternal and child health care services. Various studies conducted in recent years have demonstrated that improved sanitary conditions and access to safe drinking water are important factors contributing to a decline in child mortality. Many studies have demonstrated increased mortality risks among children born after short birth intervals. Maternal depletion is often cited as the primary mechanism responsible for the adverse effects of short birth intervals. Women with short intervals between two pregnancies have insufficient time to restore their nutritional reserves, a situation which is thought to adversely affect fetal growth. Competition among siblings is considered a plausible mechanism in the association between birth intervals and child survival: the newborn child has to complete with another young sibling for household resources and mother's care. The situation may have a bearing on the nutrition of the youngest child (Ali-Kabir 1984). First-born children of very young mothers are at risk of dying while infants, because of their mother's physical immaturity. Children with short preceding birth intervals are less likely than others to have ever been breast-fed.

Parental education, through its impact on household income, has both direct and indirect effects on child survival. The effect is more pronounced in environments dominated by uncertainties that are created by both men and nature. For example, household income can have a dramatic effect in reducing malnutrition, especially during periods of crisis where food prices usually rise dramatically. Education also plays a direct role in shaping parental behaviour towards their children. (Tabutin D, Akoto E 1992). The inverse relationship between mother's education and infant and child mortality is supported by many studies in widely different populations (Frenzen P, Hogan D 1982). Caldwell 1979 suggested that educated mothers are more likely to shift from a 'fatalistic' acceptance of health outcomes towards the implementation of simple health-promoting practices. This often includes an increased capacity to manipulate modern medical systems. Caldwell1994 suggests that father's education increases the survival chances of children through the greater knowledge and affluence it brings to the household. In this study, we hypothesize that the impact of parental education on child mortality will be more profound during times of crises because educated parents are more likely to be able to protect their children from military conflict, famine, and disruptions of the social and physical environment. Educated parents are more likely to have food reserves for their children during famine periods and fathers with higher education are expected to have better coping strategies and better economic resources (Shaikh K. 1984). Consequently, they are more able to send their children to safe places during war. Because of these independent avenues of influence of mother's and father's education we hypothesize that mother and father's education will have a joint impact on child survival during time of crisis

The main purpose of this study is to examine the role of mother's and father's education in reducing excess child mortality in a small area (Thakurgaon District) of Bangladesh.

Data Sources and Methodology

We utilize the data for analysis extracted for Thakurgaon district in Bangladesh. The district of Thakurgoan area is 1810 square km. and its male population is 626720 and female population is 587940 and density is 671 per square km. In this study, 500 respondents were questioned during the survey period in 2009. The respondents were randomly interviewed by some selected questions from several villages in the rural area and urban area of Thakurgaon Thana in Thakurgaon district, Bangladesh by purposive sampling technique. Various socio-economic and demographic variables were considered at the time of data collection.

Path Analysis

A path analysis is one of such techniques of showing causal linkages among the interrelated variables. The technique of path analysis, which was developed during the 1920s by Sewall Wright as an aid to the quantitative development of genetics, gained popularity in social science studies with the further expositions. Recently its application has gained popularity in demography (Leobner and Driver, 1973; Kendall and O' Muircheartiagh, 1977). Path analysis presumes the existence of a causal framework interlinking different predictor variables with the response variables. Such representation of the causal variables is called a path model and it is both stochastic and explanatory and it is said to be an extension of the multiple regression model. It helps in estimating the magnitude of the linkages between interrelated variables and provides information about the underlying causal processes. This technique explores a chain of relationship among the variables by using standardized regression coefficients of a set of regression equations. The fundamental to the path analysis is the path diagram which is the outcome of a set of linearly interrelated variables and the assumed causal relationship among them. In the path diagram the following principles are as follows:

(i) the variables are arranged from the left in such a way that all the endogenous variables are to the right of their exogenous variables

(ii) the unidirectional straight arrows called henceforth as causal paths that go from left to right represents the endogenous variables and

(iii) on the other hand, the two-headed curvilinear arrows represent the non-causal (correlated) relationship among the exogenous variables. This study employs a

recursive path model relating to the effect of female education on child health.

Methods and Model Specification for Path Analysis

Path analysis is a straightforward extension of multiple regression. Its aim is to provide estimates of the magnitude and significance of hypothesized causal connections between sets of variables. This analysis disentangles the specific mechanisms of the socio-economic factors that affect child health by taking into consideration the intermediate variables involved in the analytical system. Moreover, path analysis provides a theoretical model specified as a system of simultaneous regression equations, which are linear, additive and usually recursive (Boyle, 1970: 461-480). This is best explained by considering a path diagram. In our research study a number of socio-economic and demographic variables are available. Among them, ten variables have been taken into consideration in the present study in order to construct a path analysis. Table 1 gives a detailed description of the variables. Place of residence, respondent's education, respondent's occupation, monthly income, and religion are considered as the socio-economic and background variables, while the demographic, as well as intermediate variables regarded in this analysis, are age at marriage, medical check up during pregnancy, type of delivery and number of child alive. Finally, the number of children dead is used here as a measure of child mortality.

Path coefficients are standardized regression coefficients in a system of linear regression equations, usually denoted as Pij, where the first subscript shows the dependent variable and the second subscript indicates to the variable whose direct effect on the variable is measured. In other hands, Pij are path coefficients representing the direct effect of j on variable i. A path coefficient gives the proportion of the standard deviation of the dependent variable

for which the independent variable is directly responsible. In other words,

$$P_{ij} = \frac{\sigma_j}{\sigma_i}$$

Where σ_j, and σ_i denote the standard deviation of the dependent and independent variables respectively (Chandrasekaran and Hermalin, 1975).

The path estimation equations are useful

(i) in deriving path coefficients,

(ii) in deriving the direct, indirect and residual or joint effects and

(iii) in predicting the implied correlation. The path estimation equations are derived from the structural equations by applying the basic theorem of the path analysis. Thus, it is to be noticed that structural equations are different from the path estimation equations. According to the causal ordering of variables, we may divide the selected set of variables into three groups that are given below:

Exogenous Variable	X_1, X_2, X_3, X_4 and X_5
Endogenous variable	X_6, X_7, X_8 and X_9
Dependent variable	X_{10}

This model is a recursive path model in which each variable is assumed to be dependent upon all prior causal variables. The system of equation for the model can be written as:

X6 = P65X5 + P64 X4 + P63 X3 + P62 X2 + P61 X1+P6uRv

X7 = P7 6X6 + P7 5 X5 + P7 4 X4 + P7 3 X3 + P7 2 X2+ P7 1 X1+P7v Rw

X8 = P8 7X7 + P8 6 X6 + P8 5 X5 + P8 4 X4 + P8 3 X3+ P8 2 X2 + P8 1 X1+P8 w Rx

X9 = P9 8 X8 + P9 7 X7 + P9 6 X6 + P9 5 X5 + P9 4 X4+ P9 3 X3 + P9 2 X2 + P9 1 X1 + P9 x Ry

X10 = P10 9X9 + P10 8 X8 + P10 7 X7 + P10 6 X6 + P10 5X5 + P10 4 X4 + P10 3 X3

+ P10 2X2 +P10 1 X1+ P10 y Ryz

Where, Pij are the path coefficients and Rv, Rw, Rx Ry and Rz random disturbance terms. All the random disturbance terms are mutually independent and are independent of their corresponding explanatory variables. This system of equations are known as structural equations which gives the estimates of path coefficients and helps in understanding the important links between various variables considered in the causal model. Then multiple regression method is applied for each causal relationship. The residual of path coefficients can also be estimated with case from the regression equation as the square root of (1 - R2), where, R2 (unadjusted) is the multiple correlation coefficients (square) of the regression equation. From the path analysis the direct effects, indirect effects, implied effects and total effects of each selected explanatory variables on child mortality are determined.

Variables	Measurement
X_1 = Place of residence	1=Rural 2=Urban
X_2 = Respondent's Education	1 = Illiterate 2=Primary 3=Secondary
X_3 = Husband's Education	1 = Illiterate 2=Primary 3=Secondary 4=Higher
X_4 = Monthly income	1=Below 5000 2=5000-10000 3=10001 and above
X_5 = Religion	1=Muslims 2=Hindu 3=Others
X_6 = Age at marriage	1 = <15 years 2 = 15 to 22 years 3 = >22 years
X_7 = Medical check up during pregnancy	1 = Yes 2 = No
X_8 = Type of delivery	1=Hospitals 2=Home 3=Others
X_9 = Number of children alive	1=0 2=1-3 3=4-5 4=6 and above
X_{10} =Number of children dead	1 = Yes 2= No

Table 1: Variables and their measurement used in the path analysis

Result and Discussion

Age is an important factor of child mortality. From Table 2 we observed that 33.4% of the respondents are aged less than 15 years, 39.8% of the respondents are 15-22 years of age and 26.8% of the respondents are aged more than 22 years. In demography, residence means the type of community ranging from rural to urban in which people live. 66% of the respondents live in rural areas and 34% live in urban areas. The potential impact of education on various aspects of behaviour, including reproductive and family planning behaviours, is too obvious to call for any discussion. In the same Table we also observed that 54.6% of the respondents have no education, 27.8% of the respondents have primary education and 17.6% of the respondents have secondary education. On the other side 37.8% of husbands have no education, 35% havee primary education, 18.2% have secondary education and

only 9% have higher education. We see that most of the respondents are illiterate, who have not any education. Education is the major means today for reducing child mortality because educated parents are more conscious about their life and their children. The working status of respondents has a valuable influence on child mortality. Women's status is widely acknowledged as one of the main determinants of child mortality decline in developed countries. The Table also shows that 90.4 % of the respondents are housewives, 4.6 % of the respondents are engaged in services and 5 % are engaged in other occupations. For most of the respondents, family monthly income is low, only for 19.4% is it high and on the other hand about 17% of respondents have high family expenditure. Age at marriage is closely related to child mortality; over the duration of married life. About 54.4% of respondent have age at marriage below 15 years. About 73.4% are Muslims and only about 24% are Hindus. About 63.4% of respondents use contraceptives and 36.6% don't use contraceptives. Among these respondents who don't use contraception, they believe that if contraceptives are used Allah is punished. As result they bear many child and a few of them die. They also believe that Allah protect their child if they were sick. They cannot go to a doctor if their child is sick, they go to Kobiraj or Emam. About 73.6% respondents do not have a check up during the pregnancy period. Most of the respondents takes their delivery as a home service and for about 40.2% of the respondents, their family size is 4-5 persons.

Higher than 99% have had immunization during the pregnancy period. About 45.4% of respondents take their two child birth space for only one year and for about 23.4% it is 2 years. About 57.4% have 1-3 children and 93.4% want a son; most of the respondents believed that their child died from diseases. About 67.4% of respondents drink tube well water, 21.2% use a tap and 11.4% use a pond or other sources. Sanitary management is not good; only 25.2% of respondents use sanitary facilities, about 63.4% use semi building sanitary facilities and 9.4% of respondents use kacha latin.

Categories	Frequency	Percentage
Age Group of Respondents		
<15 years	167	33.4
15 to 22 years	199	39.8
>22 years	134	26.8
Place of Residence		
Rural	330	66.0
Urban	170	34.0
Respondents education		
Illiterate	273	54.6
Primary	139	27.8
Secondary	88	17.6
Respondents occupation		
Housewife	455	90.4
Service	20	4.6
Others	25	5.0
Husband Education		
Illiterate	189	37.8
Primary	175	35.0
Secondary	91	18.2
Higher education	45	9.0
Husband Occupation		
Farmer	280	56.0
Service	112	22.4
Others	108	21.6
Monthly Income		
Below 5000	265	53.0
5000-10000	138	27.6
10001 and above	97	19.4
Monthly Expenditure		
Below 4000	289	57.8
4000-9000	143	28.6
9001 and above	68	13.6
Age at Marriage		
Below 15	272	54.4
15-22	194	38.8
23 and above	34	6.8
Religion		
Muslims	367	73.4
Hindu	120	24.0
Others	13	2.6
Contraceptive Use		
Yes	308	61.6
No	192	38.4

Table 2: Socio-economic and Demographic Background characteristics of the study on child Mortality, Thakurgon District, Bangladesh 2009

Family member		
2-3	74	14.8
4-5	201	40.2
6-7	135	27
Above	90	18
Respondent Health check up during pregnancy		
Yes		
No	122	24.4
	368	73.6
Respondent take Immunization during pregnancy		
Yes		
No	495	99.0
	05	1.0
Place of Delivery		
Hospitals	129	25.8
Home	356	71.2
Others	25	5.0
Birth Spacing between Two Children		
1 years	227	45.4
2 years	117	23.4
3 years	77	15.4
4 Years	45	9.0
Above	34	6.8
Number of Children		
0	48	9.6
1-3	287	57.4
4-5	138	27.6
6 and above	27	5.4
Son Preference		
Yes	467	93.4
No	33	6.6
Number of children die		
0	380	76.0
1-2	102	20.4
3 and above	18	3.6
Reason for child mortality		
Diseases	478	95.6
Normal	22	4.4
Sources of water		
Tube well	337	67.4
Tap	106	21.2
Pond	57	11.4
Quality of sanitation		
Sanitary	126	25.2
Semi Building	317	63.4
Kacha	47	9.4

Table 2a: Socio-economic and Demographic Background characteristics of the study on child Mortality, Thakurgon District, Bangladesh 2009 (Continuation of Table 2)

Variable	X₁	X₂	X₃	X₄	X₅	X₆	X₇	X₈	X₉	X₁₀
X₁	1.00	.102	.023	-.077	.076	.080	.133	-.052	.041	-.239**
X₂		1.00	.763**	.369**	-.095	.488**	-.507**	.224**	-.209**	-.111
X₃			1.00	.425**	-.033*	.446**	-.461**	.221**	-.130	-.001
X₄				1.00	-.101	.293**	-.279**	.337**	.079	.045*
X₅					1.00	-.148*	.121	.005	.031**	-.030
X₆						1.00	-.398**	.138	-.027	-.103**
X₇							1.00	-.324**	.232**	.114**
X₈								1.00	-.175	-.084*
X₉									1.00	.043
X₁₀										1.000

Table 3: Zero order correlation coefficient among selected socio-economic and demographic variables

In Table 3, we depict that place of residence(X1), Age at marriage (X6) and types of delivery (X8) have a negative significant effect on child mortality; on the other hand Monthly income (X4) and medical check up during pregnancy (X7) have positive significant effects on child mortality. Respondent's education (X2), husband's education (X3) and religion (X5) have a negative insignificant effect on child mortality and at the same time the number of children has a positive insignificant effect on child mortality. This Table also shows that respondent education has a negative significant effect on medical check up during pregnancy and number of children and a positive significant effect on monthly income, age at marriage and type of delivery. Husband's education has a positive significant effect on monthly income, and age at marriage. The different types of variables are presented in Tables 1 and Table 3 is a zero order correlation coefficient between child mortality and the selected socio-economic and demographic variables.

Dep. Vari	Sel. Vari.	Total Associa tion	Total Effect	Non-Causal Effect	Indirect Effect Via				Other Vari. (Implied effect)	Direct Effect
					X₆	X₇	X₈	X₉		
X₁₀	X₁	-.239	0.523	.862	.060	.178	.002	.049	.234	--
	X₂	-.111	-0.416	-.305	.316	-.328	.027	-.271	-.160	--
	X₃	-.001	0.258	.259	.155	-.116	-.019	.043	.195	--
	X₄	.045	0.665	.620	.104	-.036	.281	.234	.082	--
	X₅	-.030	-0.019	.011	-.106	.042	.061	.021	-.037	--
	X₆	-.103	-0.179	-.076		-.183	-.046	.106		-.056
	X₇	.114	0.037	-.077			-.267	.166		--.138
	X₈	-.084	-0.247	-.163				-.165		-.082
	X₉	.043	-0.014	-.014	--	--	--			-.014

Table 4: Analysis of the Socio-Economic and Demographic factors on Child Mortality through the selected variables

Table 3 indicates that, with view expectations of zero order correlation coefficients between child mortality and each of the selected variables, generally do not differ much from their corresponding total effects. In Figure 1 we observe that there are 17 paths out of 30 hypothesized paths found to be statistically significant. In our study we have to mention the significant path coefficients only. In Figure 1 out of 9 variables, only four variables are found to have a significant effect on child mortality. Among them, age at marriage, and number of children, have direct negative significant effects on child mortality. Type of delivery has a negative direct insignificant effect on child mortality. Place of residence and husband's education have indirect positive significant effects, on the other hand religion has an indirect negative significant effect on child mortality. Respondent's education has an indirect negative insignificant effect and monthly income has a positive insignificant effect on child mortality.

In Table 4, we reveal the total effects of type of place of residence and husband's education (X1) and (X3) on child mortality (X10) is 0.234 and .195 of which about 44.75% and 36.94% are conducted through its implied effect and about 11.13% it acts through monthly income (X4) in the same direction then about 14.52% and 13.85 % are transmitted through respondent education (X2) and religion (X5) in the opposite direction.
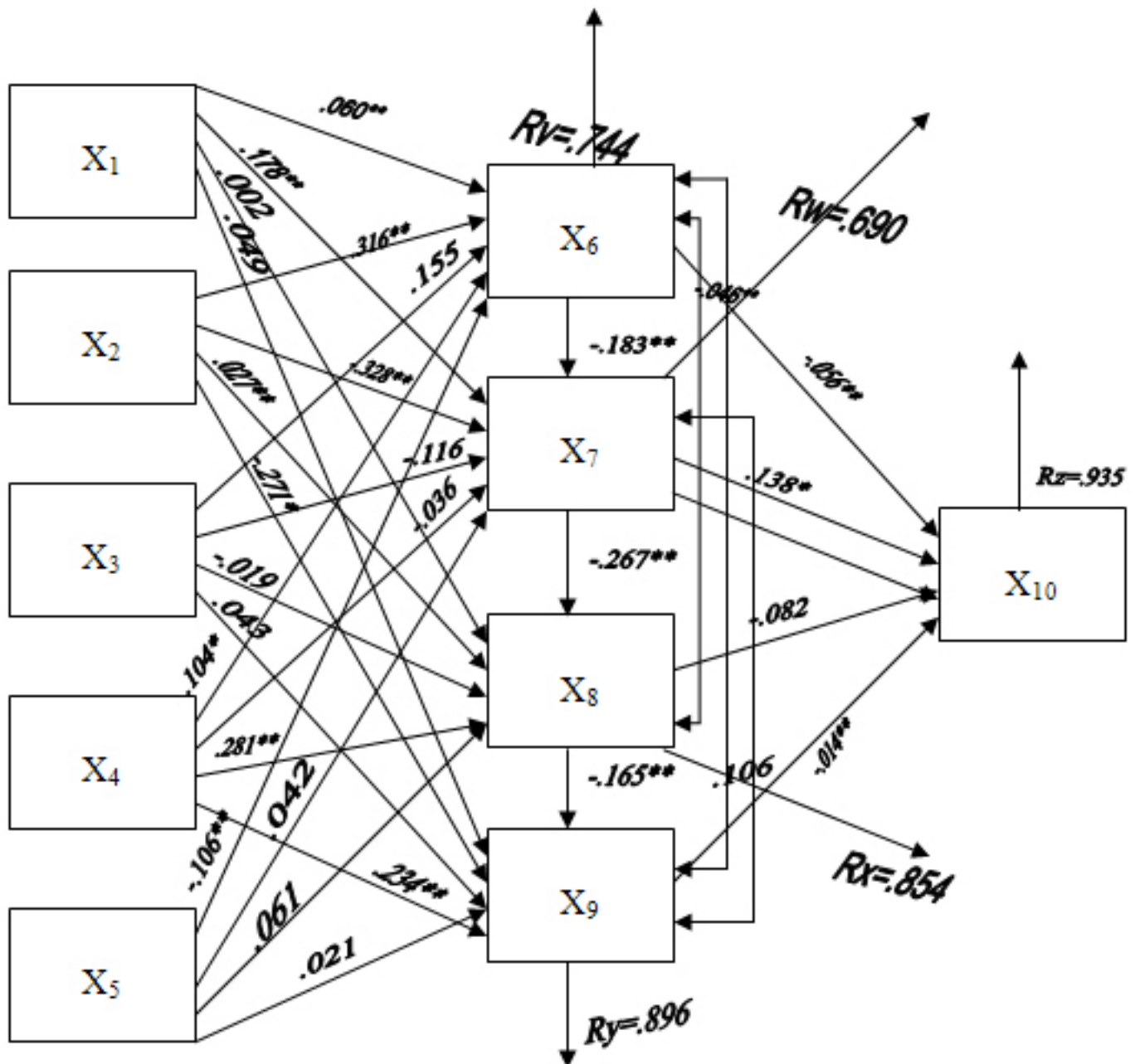
Figure 1: Effects of the selected Socio-Economic and Demographic variables on Child Mortality

The total effect of respondent's education, religion, age at marriage, type of delivery and number of children have a negative effect on child mortality, on the other hand place of residence, husband's education, monthly income and medical check up during pregnancy have positive effects on child mortality. It is also observed that for place of residence and monthly income, on child mortality about 11.47% and about14.12% is transmitted through age at marriage (X6) and about 34.03% and about 4.88% is attributed to acts through medical check-up during pregnancy

(X7) in the same direction of its total effect. We reveal that respondent's education and age at marriage on child mortality are about 2.45% and 11.76% and through type of delivery and about 24.59% and 27.11% is transmitted through number of children (X9) in the same direction.

The total association of place of residence, respondent's education, husband's education, religion, age at marriage and type of delivery have a negative effect on child mortality and other variables such as monthly income, medical check up and number of children have a positive effect on child mortality.

Conclusion

In the face of formidable socio-cultural and economic constraints impressive progress has been made in the area of child mortality in Bangladesh. The study documented a change in sustainable child mortality decline over a decade or two, but is less coherent with policy goals and targets. The achievement of the goals and targets to reduce child mortality seem to depend largely on steady improvement in the basic conditions of life of the poor and neglected vulnerable groups of the population and not on family planning programs alone. Birth

Dep. Vari	Sel. Vari.	Indirect Effect Via				Other Variables (Implied effect)	Direct Effect
		X_6	X_7	X_8	X_9		
X_{10}	X_1	11.47	34.03	.39	9.36	44.75	--
	X_2	28.67	29.77	2.45	24.59	14.52	--
	X_3	29.35	21.97	3.60	8.14	36.94	--
	X_4	14.12	4.88	38.12	31.75	11.13	--
	X_5	39.70	15.73	22.85	7.87	13.85	--
	X_6	--	46.80	11.76	27.11	--	14.33
	X_7	--	--	46.76	29.07	--	24.17
	X_8	--	--	--	66.80	--	33.20
	X_9	--	--	--	--	--	100

Table 5: Percentages of the Total Absolute Effect on Child Mortality through Endogenous and Exogenous Variables

should be reduced in very young mothers (<18 years) to postponement of premature birth, unwanted pregnancies, and unstable marital union. This study shows that child mortality is high where parents have no education (illiterate), do not attend medical check-up during pregnancy, have the right place of delivery, have low income of parents and to number of children. A well-known multivariate technique named path analysis suggested that educational qualification of respondents has a direct significant positive effect on child mortality. Age at marriage, age at first marriage, monthly income and medical checkup during pregnancy also have indirect significant effects on child mortality, because education may provide better employment opportunities outside of the home and age at marriage can be raised through providing education. When parents get proper education they tend to take medical checkups during pregnancy and the tendency of giving birth with trained birth attendants can be increased. Finally we may conclude that parent's education has an important influence on reducing child mortality.

References

Ali-Kabir, A. (1984) Effects of community factors on infant and child mortality in Bangladesh, World Fertility Survey (WFS), Scientific Reports, No. 56, London

Caldwell J (1979). Education as a factor in mortality decline: an examination of Nigerian data. Popul Stud 1979;33:395-419.

Caldwell J (1994). How is greater maternal education translated into lower child mortality? Health Transit Rev 1994;4:224-29.

Frenzen P, Hogan D. The impact of class, education, and health care on infant mortality in a developing society: the case of rural Thailand. Demography 1982;19:391-408.

Kendall, M.G. and Muircheartaign 1977. Path Analysis and Model Building-Technical Bulletin No.2/Tech. 414", World Fertility Survey, Netherlands: International Statistical institute.

Leobner, H. and E.D. Driver, 1973. Differential Fertility in Central India: A Path Analysis", Demography, Vol.10, No. 3, Pp. 329-349.

Mosely, W.H. and L.C. Chen (1984) An analytical framework for the study of the child survival in developing countries, Population and Development Review, Supplement to Volume 10, Pp. 25-45.

Shaikh K. 1984. Nuptiality Pattern in Rural Bangladesh". Demography India, 13:1

Tabutin D, Akoto E (1992). Socio-economic and cultural differences in the mortality of sub-Saharan Africa. In: de Wall V, Pison, Sala-Diakanda (eds). Mortality and Society in Sub-Saharan Africa. Oxford: Clarendon Press, 1992, pp.32-64.

United Nations 1991. Child mortality in developing countries: Socio-economic differentials, trends and implications, New York, 1991.