

FACULTY OF HEALTH SCIENCE
UNIVERSITY OF MUHAMMADIYAH JEMBER



PROCEEDING BOOK

The 1st International Nursing Conference
“ Evidence Based Practice Of Entrepreneur In Pediatric
Nursing To Optimize Growth & Development “



June 6 2015 at Ahmad Zainuri Hall,
University Of Muhammadiyah Jember

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PROLOGUE

The increase of society awareness toward their rights in law, the open of free market era, the increase of national and international competition, and the increase of primary educational quality are a kind of challenge needed to be answered in the field of nursing. The orientation says that the bachelor of nursing will become a great nurse who needs to be improved.

Nowadays, the world has began to move into an entrepreneurship field, where every generation should begin to sell their creativity and competence to meet the needs of work place. Besides, the field of children nursing, the nurse is required to overcome the problems professionally in some occasion. It seems that the problem becomes harder to be realized by the generation of nurse if the trending problems like that is not supported by the instruction of nursing education providers well.

One obvious thing diffentiating nursing and other professional health workers nowadays is that nursing has not found yet the form of primary services that can be applied and become nurse's authority only. Thus, the development of entrepreneurship needs to be built so that the nurse's creativity can grow and become a valuable selling product and competitive center for the host as the basis to begin working in the real work place which still have a strict competition comparing with few years ago.

Entrepreneurship is enclosed by the effort to earn money without depending too much with other people. Perhaps, it makes some people think about trading only. Further, entrepreneurship does not only talk about selling-buying terms, but also it tends to improve the creativity for opening a new chance to create self-job vacancy, selling new ideas, developing ideas and daily events, and combining common things. It then becomes an incredible thing and has the higher selling values than before.

Actually, entrepreneurship for the nurse is able to be learnt while doing (learning by doing), but it should be remembered that the knowledge of a certain type of effort is needed because it will be like diving in the sea sore without using oxygen tube. Therefore, it will not be that hard if the nurse are able to implement this kind of concept comprehensively.

The nurse's routine activities in room while the patients getting a care and nursing, they often used their free time to prepare medical tools to sterilized, preparing the set to clients daily care and other minor things. It finally becomes a picture on how if the existing phenomenon is implemented well to get the valuable selling.

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**LITERATURE REVIEW: CATARACTOGENESIS IN PATIENTS WITH
DIABETES MELLITUS**

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ABSTRACT

Background: Several studies have shown that oxidative stress plays an important role in the mechanism of cataract known as cataractogenesis. Oxidative stress occurs when free radicals exceeds the ability of lens cells to eliminate. Hyperglycemia in diabetic patients increases the amount of oxidative stress that accelerates the process of cataractogenesis. **Objective:** improve knowledge about the mechanisms cataractogenesis in DM patients based on evidence based. **Methods:** The source journal / article is used obtained from a search through Google Scholar from 2005 to 2015. Then the authors make an assessment of the journal / article up to the stage of making literature review. **Results:** This review illustrates that the process cataractogenesis in diabetes mellitus occurs through three ways, among others: 1) Mechanism of glucose autooxidation, 2) Glycation of nonenzimatik protein, and 3) Activities polyol metabolic pathway that further accelerate the formation of reactive oxygen compounds, ie free radicals containing oxygen. **Conclusion:** The process cataractogenesis in DM patients more quickly than non-DM.

Keywords: cataract, cataractogenesis, diabetes mellitus

INTRODUCTION

Cataract is the leading cause of blindness in Indonesia and in the world (Budijanto, 2014). Cataract is an eye disease where the lens becomes cloudy so blurred vision (Soehardjo, 2004). Estimates of the incidence of cataracts was 0.1% / year or every year among 1,000 people there is a new cataract patients. The figure puts Indonesia as the country with the highest blindness in Southeast Asia (Kusuma, 2008). Indonesia's population also has a tendency to suffer from cataracts 15 years sooner than people in the subtropics (Soehardjo, 2004).

Based on age, the Indonesian Association of Ophthalmologists (Perdami) in 2013 noted, the prevalence of blindness due to cataract higher in older age groups. In the age group 45-59 years, the prevalence of blindness due to cataract 20 cases per 1,000 people. As for the age group over 60 years, 50 cases per 1,000 people (Anna, 2014). In the elderly decreased body functions include metabolic functions, causing *Diabetes Mellitus* (DM) (Christanty, 2008). DM is a disease that damages the body's systems such as macrovascular and microvascular disorder that impaired organ function as a lens. The prevalence of diabetes in the world in 2000 estimated 2.8%, or about 171 million patients. In 2030 DM is expected to rise to 4.4%, or about 366 million patients (Javadi & Ghanavati, 2008). Patients with DM 4.9 times higher risk of cataracts (Arimbi, 2012). Research shows that 31.4% of cataract patients also suffer from diabetes (Tana, Rifati, & Kristanto, 2009). The process of cataract formation, known as cataractogenesis in diabetic patients more quickly than non-DM, it means that the lens in people suffering from diabetes faster cloudy. Literature review will discuss more about the process of formation of cataract (*cataractogenesis*) in patients with DM. The purpose of making this literature review is to increase the

knowledge about the mechanisms cataractogenesis in DM patients based on evidence based.

METHODS

The preparation of this literature review begins with the selection of the topic, followed by a search through Google Scholar journal by using keywords. This search is limited to journals and articles from 2005 to 2015. The key words are "cataract, *diabetes mellitus*, *diabetic retinopathy*, visual acuity, *oxidative stress*, *reactive oxygen species*, *malondialdehyde*".

Fulltext articles and abstracts were reviewed in accordance with the inclusion criteria. Criteria for inclusion in the literature review are: cataracts in diabetes mellitus and mechanism of cataract formation in diabetes mellitus. Search using the keywords "cataract, *diabetes mellitus*, *diabetic retinopathy*" found 151 journals and articles. Search resumes using keywords "cataract, diabetes mellitus, *diabetic retinopathy*, vision acuity, *oxidative stress*, *reactive oxygen species*, *malondialdehyde*" found 47 journals and articles, but in accordance with the criteria for inclusion only two articles, the next two articles are reviewed.

RESULTS

Literature review article examines two descriptive analytic. Research by Ni Made Lienderi Wati (2013) with the title "*Malondialdehyde Levels in Patients with Diabetes Mellitus Higher than Non Diabetes in Senile Cataracts immature*" cross sectional approach, large samples of 82 people by consecutive sampling technique, and the data were analyzed using t-test independent with $\alpha = 0.05$. Results from this study states *malondyaldehyde* levels (MDA) of patients with diabetes mellitus is higher than non-diabetic mellitus in immature senile cataract. These results are consistent with research conducted by

Nungki Rusydiana Purnaningrum (2014) with the title "The difference postoperative visual acuity (Phacoemulsification) in Senile Cataract Patients with Diabetes Mellitus and non Diabetes Mellitus. This study used cross sectional approach, a sample of 40 patients with senile cataract patients with DM and 40 senile cataract non DM with simple random sampling technique. Analysis using the Mann Whitney test with $\alpha= 0.05$. The results obtained are phacoemulsification can improve visual acuity in patients with senile cataract non DM better.

Cataracts in diabetic patients or often known as diabetic cataract is the main cause of visual impairment in patients with diabetes mellitus. Pathophysiology of diabetic cataract associated with the accumulation of sorbitol in the lens and the lens protein denaturation (Ilyas, 2006). Another theory says that there are three mechanisms of a cataract caused by hyperglycemia, is (Setiawan & Suhartono, 2005):

1) The mechanism of glucose autooxidation, or reactive oxygen compounds that contain oxygen free radicals in diabetic patients will induce lipid peroxidation resulting in the modification of cellular macromolecules such as lipids, DNA and proteins in various tissues including the eye lens. Modification of cellular macromolecules in various tissues have led to a complex syndrome in people with diabetes including cataracts.

2) Glycation of protein nonenzimatik, elevated levels of glucose in the aqueous humor can induce protein glycation in the lens, a process that produces superoxide radical (O_2^-) and the formation of advanced glycation endproducts / AGE also trigger the formation of free radicals (France, Stein, & Dawczynski, 2003).

3) Activity polyol metabolic pathway that further accelerate the formation of reactive oxygen compounds are free radicals

containing oxygen, turbidity in the lens can occur due to hydration (fluid replenishment) lens, or as a result of denaturation of lens proteins. In diabetes mellitus, the accumulation of sorbitol in the lens that will increase osmotic pressure and cause fluid to build up in the lens. While the protein denaturation occurs due to oxidative stress by Reactive Oxygen Species (ROS), which oxidize proteins lens (crystalline) (Pollreis & Erfurth, 2009). The formation of excessive reactive oxygen compounds resulting in an imbalance between protective antioxidants and free radicals in patients with DM resulting in oxidative damage known as oxidative stress (Setiawan & Suhartono, 2005). Oxidative damage in diabetic patients is characterized by increased levels of MDA in diabetic patients is higher than the non DM (Marjani, 2010).

IMPLICATIONS FOR NURSING PRACTICE

This literature review has implications for nursing practice, especially medical-surgical nursing. Information about the influence of hyperglycemia in patients with diabetes to change the structure of the lens to become cloudy (cataract) can increase our knowledge of one of the high risk associated with cataracts so it can be a reference material in health education theory about cataracts and can do the prevention of cataracts, especially for patients with DM.

CONCLUSION

Conclusions from the literature review are:

1. Cataract is a disease due to cloudy lens so that the eye can not see clearly can even lead to blindness. One of the biggest risk of a cataract is hyperglycemia in patients with diabetes mellitus.

2. The process of cataract formation (cataractogenesis) in patients with diabetes through three ways, namely:
 - 1) Mechanism of glucose autooxidation,
 - 2) Glycation of protein nonenzimatik,
 - and 3) Activities polyol metabolic pathway that further accelerate the formation of reactive oxygen species
3. The process of cataract formation (cataractogenesis) in DM patients more quickly than non-DM.

SUGGESTIONS

Suggestions can be submitted include:

1. Need for health education to the public about efforts to maintain eye health by controlling the consumption of excessive glucose from being exposed to the risk of diabetes resulting in cataracts.
2. Need to do more research in Indonesia, for example further explore research variables such as how to act to prevent the occurrence of cataracts for people with diabetes.
3. Improving socialization Healthy Eyes Vision 2020 and perform real strategic program for the community, especially the prevention and treatment of cataract disease as the number one cause of blindness in Indonesia and the world.

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