

# Peer Support Education Reducing Pain Perception and Improving Blood Glucose Control of Diabetes Mellitus

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## Abstract

**Background:** Diabetes mellitus (DM) is a chronic disease that requires long-term or lifelong care of DM patients. DM disease management in the Perkeni consensus (2013) is education, nutrition therapy, physical exercise, and pharmacological therapy.

**Material and Method:** This research uses Quasi-Experimental Design with Non-Random Pretest-Posttest Design. The purpose of this study was to analyze changes in disease perception and blood glucose control in patients with type 2 diabetes mellitus after being given peer support education. This research method is an experimental research with Quasi - Experimental Pretest-Posttest Design. The sample consisted of 60 respondents. Sampling is done by purposive sampling.

**Result:** Our study showed the average age of respondents was 56.44 years, most women, basic education, received OHO therapy, with an average length of illness was 8.93 years and suffered from complications of heart disease and neuropathy, before being given peer support education, control blood glucose: the average fasting blood glucose is 152.81 mg/dl, an average weight of 59.97 kg, an average blood pressure of 158.56/84.25 mmHg and an average pain perception of 69.75. After peer support education, blood glucose control: mean fasting blood glucose is 137.75 mg/dl, average weight 59.56 kg, average blood pressure 147.19/76.25 mmHg and average pain perception in the treatment group increased the average perception to 64.44.

**Conclusions:** Further analysis showed that peer support education was 0.001 in reducing pain perception. This study concludes that peer education support is effective in reducing pain perception and improving blood glucose control. The recommendation of this research is to do more respondents and more time.

**Keywords:** *Peer Support Education, the pain perception, blood glucose control.*

## Introduction

Diabetes mellitus (DM) is a metabolic disease in which the body's ability to use it, fat and protein are disrupted, related to insulin or insulin resistance <sup>1</sup>. DM is a chronic disease characterized by a lack of insulin or a decrease in the body's ability to use insulin. There are various types of DM, namely: type 1 DM, which arises due to damage to pancreatic beta cells that have not been recognized or due to auto immune processes, type-2 DM caused by cell resistance to insulin which causes beta cell damage, DM in pregnancy) and DM other types <sup>2</sup>. Type 2 DM is the largest group of all types of DM that

reaches 95% of total DM cases <sup>3</sup>. The results of the 2013 RISKESDAS also showed East Java following the order of East Kalimantan for the prevalence of diabetes. The results of a preliminary study in one of Malang district hospitals in 2014, the average visit of DM patients was 452 patients. Based on these data, the prevalence of diabetes is very high.

From this background, the authors were interested in examining the influence of peer support education on the pain perception and blood glucose control in patients with diabetes mellitus in Hospital.

### Material and Method

The sample of this study was 60 people and was taken by purposive sampling. The respondent inclusion criteria were: (1) Stable condition, not experiencing acute hyperglycemia. (2) Willing to be a research respondent.

The variable in this study was the peer support education independent variable and the dependent variable was the pain perception and blood glucose control. Measurement of pain perceptions used a questionnaire by DM Pain Perception consisted of 25 questions measured by a Likert scale. Blood glucose control is measured through: fasting blood glucose, blood pressure and weight.

Analysis of this research data was to identify differences in blood glucose control before and after peer group education conducted t-test 2 paired samples and to identify differences in perceptions before and after peer group education performed Wilcoxon Signed Rank Test.

### Result

**Table 1. Distribution of Respondents by Age, duration of illness and blood glucose in Hospital in November 2015**

| Variable            | Mean  | SD     | Min-Maks | 95% CI      |
|---------------------|-------|--------|----------|-------------|
| Age                 | 56.44 | 11.105 | 30 - 70  | 50.52–62.36 |
| Duration of illness | 8.93  | 6.4    | 0.5 - 20 | 5.53–12.35  |

The average age of DM patients was 56.44 years (95% CI: 50.52 - 62.36), with standard deviation 11.105. The youngest age of the respondents was 30 years and the oldest was 70 years. The results of the analysis showed that the average duration of illness of patients with DM was 8.93 years (95% CI: 5.53 - 12.35), with a standard deviation 6.4. The respondents had the fastest DM 5 years and the longest 20 years.

**Table 2. Distribution of Respondents by Gender, Education, Therapy, Other Suffered Diseases at Hospital in November 2015**

| Variable                                | Amount | Percentage (%) |
|---|--------|----------------|
| <b>Gender:</b>                          |        |                |
| - Female                                | 43     | 71             |
| - Male                                  | 17     | 29             |
| <b>Education:</b>                       |        |                |
| - Not Graduating from Elementary School | 13     | 22             |
| - Graduated from Elementary School      | 25     | 42             |
| - Junior High School                    | 14     | 23             |
| - Senior High School                    | 3      | 5              |
| - University/College                    | 5      | 8              |
| <b>Therapy:</b>                         |        |                |
| - Oral Pill/DM Drugs                    | 39     | 65             |
| - Insulin                               | 21     | 35             |
| <b>Other suffered illness:</b>          |        |                |
| - None                                  | 11     | 18             |
| - Retinopathy                           | 21     | 35             |
| - Neuropathy                            | 19     | 32             |
| - Heart Disease                         | 9      | 15             |

Distribution of respondents by their gender showed that most of them were female, they were 43 people (81%). Distribution of respondents based on education level showed that elementary and junior high school education was almost the same, namely 13 people (31%) for those with elementary education and 14 people (25%) for those with junior high school education. The

distribution of respondents based on the obtained therapy showed that most of them received oral DM/pill therapy which was 39 people (65%). While the distribution of respondents based on other suffered diseases showed that respondents who experienced neuropathy and heart disease were the same, namely 19 people (44%).

**Table 3. Changes in blood glucose control before and after Peer Support Education was given in Hospital in November 2015**

| Variable                 |        | Average | SD    | SE   | p-value |
|--------------------------|--------|---------|-------|------|---------|
| Fasting blood glucose    | Before | 152.81  | 31.94 | 7.98 | 0.006   |
|                          | After  | 137.75  | 26.64 | 6.66 |         |
| Systolic Blood Pressure  | Before | 158.56  | 24.69 | 6.17 | 0.000   |
|                          | After  | 147.19  | 28.00 | 7.00 |         |
| Diastolic Blood Pressure | Before | 86.25   | 11.69 | 2.92 | 0.002   |
|                          | After  | 76.25   | 13.48 | 3.37 |         |
| Weight                   | Before | 59.97   | 11.46 | 2.86 | 0.005   |
|                          | After  | 59.56   | 11.62 | 2.90 |         |

\* Meaning at  $\alpha < 0.05$

Based on table 3, the statistical test results obtained a value of 0.006, it could be concluded that there were significant differences in fasting blood glucose before and after Peer Support Education. The statistical test results obtained a value of 0.000, it could be concluded that there were significant differences in systolic blood pressure before and after Peer Support Education, the

statistical test results obtained a value of 0.002 so it could be concluded that there were significant differences in diastolic blood pressure before and after Peer Support Education and the statistical test results obtained a value of 0.005, it could be concluded that there were significant differences in body weight before and after Peer Support Education.

**Table 4. Changes in pain perceptions before and after Peer Support Education was given in Hospital in November 2015**

| Variable        |        | Average | SD   | p-value |
|-----------------|--------|---------|------|---------|
| Pain Perception | Before | 69.75   | 7.11 | 0.001   |
|                 | After  | 64.44   | 6.47 |         |

\* Meaning at  $\alpha < 0.05$

The average pain perception in measurements before Peer Support Education was 69.75 with standard deviation 7.11. The measurement after Peer Support Education was 64.44 with standard deviation 6.47. The results of statistical tests obtained a value of 0.001, it could be concluded that there were significant differences in the pain perception before and after Peer Support Education.

### Discussion

**Changes in pain perception before and after peer support education:** In this study the perception of pain before Peer Support Education was carried out an average of 69.75. Pain perception is important for knowing one's perception of the disease and the meaning

of the disease in life<sup>4</sup>. According to Coelho, Amorim, & Prata the results of measuring quality of life are evaluations of experience of illness<sup>5</sup>. Pain experiences include perceptions of pain regarding symptoms that are felt, experience cannot perform normal bodily functions and attempts to deal with and control disease<sup>6</sup>.

In this study the results of the analysis showed that there were significant differences in the decrease in pain perception after respondents were given peer support education. with  $p = 0.001$  ( $p$  value  $< 0.05$ ). This shows that peer support education is an effective technique in reducing the perception of DM patients. Pain perception is important for knowing one's perception of the disease and the meaning of the disease in life<sup>7</sup>.

In this study respondents as someone who interacted with other individuals in the group during the peer support education process.

**Changes in blood glucose control before and after peer support education:** The results showed that the results of fasting blood glucose before peer support education carried out an average of 152.81 mg/dl with a range between 110 mg/dl to 240 mg/dl. While blood glucose after peer support education was carried out an average of 137.75 mg/dl with a range between 100 mg/dl to 210 mg/dl. Judging from the average blood glucose of respondents before and after peer support education showed a decline<sup>8</sup>. Similarly, the range of blood glucose levels after peer support education was carried out. The high level of blood glucose in a long time will cause some complicating diseases until complications occur<sup>9</sup>. The appearance of complications and complications in patients with DM can cause physical or psychological discomfort.

**Changes in perception of pain before and after peer support education:** In this study the results of the analysis showed that there were significant differences in the decrease in perception of pain after respondents were given peer support education, with  $p = 0.001$  ( $p$  value  $< 0.05$ ). This shows that peer support education is an effective technique in reducing the perception of DM patients. Pain perception is important for knowing one's perception of the disease and the meaning of the disease in life<sup>10</sup>. Pain experiences include pain perceptions regarding symptoms that are felt, experience cannot perform normal bodily functions and attempts to deal with and control disease. Significant results on changes in perceptions of pain after being given peer support education because during the education process there was a strong sharing of experiences between respondents to manage their illness. In accordance with the results of research by Heisler which states peer support can reduce health behavior problems<sup>11</sup>. Health behavior in DM patients is that patients can accept changes that occur after suffering from DM or adapt positively. Roy's adaptation model consists of 4 important aspects, including: person, Environment, Health, and Nursing<sup>1</sup>.

In this study, respondents as someone interacts with other individuals in the group during the peer support education process. The commencement of interaction between individuals in the group increases enthusiasm for always joint discussions regarding the management of the disease<sup>12</sup>. So that there were seen some respondents

who at first seemed more silent, at the meeting and both began to dare to express questions and express opinions<sup>13</sup>. With the existence of positive experiences from other respondents it will make respondents who feel it as a problem motivated that he is not alone and he can overcome the problems experienced because of his illness with the help of friends in the group<sup>14</sup>.

When a DM sufferer is confused, irritability and even depression, according to Roy & Andrew in his theory can arise because of the stimulus both inside and outside<sup>15</sup>. There were several respondents who said they were offended because their wives and children were prohibited from eating. One of them is number 13, but after the respondent told me during the discussion the respondent number 15 said that he felt happy to be reminded and that the family supported it with his wife preparing special food for her husband, the same type of food as other family members<sup>16</sup>. At the third meeting showed a decrease in the perception of pain in respondent number 13. The presence of external stimulus, peer support made changes in perceptions of pain that would bring behavior changes in the management of the disease by showing a positive response to adversity<sup>17</sup>.

## Conclusions

The average perception of pain before peer support education was 69.75. The average perception of pain after peer support education was 64.44. There were significant differences with  $p$  value = 0.001. There were significant differences in changes of blood glucose control before and after peer support education: fasting blood glucose with  $p$  value = 0.028, systolic blood pressure with  $p$  value = 0.000, diastolic blood pressure with  $p$  value = 0.001 and body weight with  $p$  value = 0.005.

**Conflict of Interest Statement :**None

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**Ethical Clearance:** Not required

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