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OUTCOME OF STAGE T1 RENAL CELL CARCINOMA TREATED WITH PARTIAL NEPHRECTOMY: INITIAL EXPERIENCES FROM A TEACHING HOSPITAL IN BANGLADESH

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ABSTRACT

Background: Renal cell carcinoma accounts for 85% of all solid tumors of the kidney. For many years, radical nephrectomy was the standard treatment for RCC. Partial nephrectomy has gradually replaced radical nephrectomy over the past decade, especially for T1 stage renal cell carcinoma. However, the benefit of partial nephrectomy on oncologic outcomes is not well known.

Objective: To investigate the clinical outcome of partial nephrectomy on T1 renal cell carcinoma.

Methods: This prospective observational study was conducted in a single unit of urology department of Dhaka Medical College Hospital, Bangladesh from the period September 2014 to September 2017. Fourteen patients underwent partial nephrectomy during this period with renal mass based on eligibility criteria. Two follow up was done at three months and six months.

Result: Mean age of the patients undergoing surgery was 52.0± 3.8 (46.0 to 57.0 years) years. For the majority of the patients, tumour size was in a range of 3-7 cm. Average operative time was 90 minutes and mean ischaemic time was 16.5 ± 4.6 minutes (14.5 to 21.0 minutes). Histopathological reports correlated with clinical diagnosis and showed adequate surgical clear margin in every case. There was no recurrence of tumour noticed during the two follow up periods. The different investigation did not reveal the impaired renal functional test during the follow-up period.

Conclusion: The clinical outcome of partial nephrectomy was found better in this study. Partial nephrectomy has the potential to replace radical nephrectomy for managing T1 tumours. However, there are some controversies regarding the post-operative oncological outcome. More studies are recommended to investigate the effect of partial nephrectomy for T1 tumours.

Keywords: Partial Nephrectomy, T1 Renal Cell Carcinoma, Bangladesh

INTRODUCTION

Renal cell carcinoma accounts for 2% to 3% of all malignant diseases in adults (Siegel, Naishadham, & Jemal, 2012) and responsible for causing 85% of all solid tumours in the kidney (Robson, 1963). In recent years, the diagnosis of early-stage RCC has increased primarily due to the broad utilization of imaging examinations including CT scan, ultrasonography, and MRI (Hollingsworth, Miller, Daignault, & Hollenbeck, 2006). For many years, radical nephrectomy was considered as the standard treatment for renal cell carcinoma. However, with increased awareness of the risk for the development of
chronic kidney disease (CKD) following radical nephrectomy, there has been growing evidence to recommend partial nephrectomy to avoid CKD (Huang et al., 2006). Partial nephrectomy has gradually replaced radical nephrectomy over the past decade, especially for the T1 stage of renal cell carcinoma. Emerging evidence suggests that it might be possible to achieve a similar result for the patients of undergoing partial nephrectomy who have tumours less than 4 cm (Joniau, Eeckt, Srirangam, & Van Poppel, 2009). Several studies also suggested that partial nephrectomy is recommended for T1 stage renal cell carcinoma (Campbell et al., 2009). This recommendation was based on hospital based retrospective studies. Due to practice of partial nephrectomy, previous studies showed that patient’s quality of life was improved, psychological trauma was reduced, and renal function was not compromised in patients with RCC (Campbell et al., 2009; Ljungberg et al., 2015).

Understanding and preventing renal ischaemic damage, the development of certain radiological imaging facility before and after surgery, and improved surgical techniques have established partial nephrectomy as one of the most acceptable therapeutic options for treating small renal masses (Lam, Shvarts, & Pantuck, 2004). While there is no doubt that partial nephrectomy has a surgical advantage over radical nephrectomy for managing small renal cell carcinoma, but the benefit of partial nephrectomy on oncologic outcomes is still controversial especially for the T1b stage. Moreover, there is lack of evidence about the effectiveness of partial nephrectomy in patients with renal cell carcinoma in developing countries. In Bangladesh, the practice of partial nephrectomy has recently established to treat small renal cell carcinoma. For example, Dhaka Medical College Hospital, a tertiary hospital in Bangladesh, had started partial nephrectomy for last 3–4 years and the aim of the study to share the initial experience regarding the outcome of partial nephrectomy for T1 renal tumour. At present, many types of research are going on to explore the effectiveness and patient compliances of partial nephrectomy as treatment alternatives. Therefore, we investigated the result of partial nephrectomy for treating T1 renal mass in patients with renal cell carcinoma.

**METHODS**

**Study design and period**
A hospital-based prospective observational study was performed between September 2014 and September 2017.

**Data source**
This study was conducted in the urology department of Dhaka Medical College Hospital (DMCH). DMCH is a tertiary level teaching hospital situated in Dhaka, Bangladesh. Fourteen patients were enrolled from the urology department of DMCH into the study based on their eligibility criteria. Inclusion criteria were renal mass ≤7 cm with no lymph node involvement and without features of metastasis. On physical examination, we have examined the patient and included those who showed general physical fitness at the time of the participation. Patients who were able to maintain his or her daily regular activities (ambulatory) and agreed to attend regular follow up visit in two-point time (3 months and six months). Patients with renal mass more than 7 cm, tumour with lymph node involvement, features of metastasis, not physically fit to maintain her/his daily regular activities were not included in the study. Participants who had suffered from recent myocardial infarction were excluded from the study.

**Operative procedure and follow up**
A detailed history taking and clinical examination of the renal mass were performed, appropriate serological investigations were performed, and renal cell carcinoma was suspected of radiological characteristics. Tumour node metastasis (TNM) staging was performed after applying the seventh edition of American Joint Committee on Cancer TNM staging system. The diagnosis of renal cell carcinoma was confirmed base on histopathological reports. After proper evaluation and counseling
of the patients, the patient were underwent partial nephrectomy through retroperitoneal approach under general anesthesia. During the procedure, after dissection of fascia of gerota, tumour was identified, and the renal artery was clamped after hilar dissection, and ice slushes were given surround the kidney maintaining the standard operative procedures. This study observed little post-operative complication. After the provision of usual post-operative care, patient was sent to inpatient management. Follow up of the patient at 3 months and 6 months was advised during the discharge of patient to observe the outcome of the study. Patients were followed up base on history (pain, haematuria, lump, any features of metastasis), physical examination (anaemia, jaundice, renal mass), imaging (CT scan of abdomen/ ultra-sonogram of the whole abdomen, Chest X-ray), serological (Liver function test, Serum creatinine and Complete blood count) when they came to hospital.

Data collection
Data were collected from the participants using semi-structured questionnaires. Data extraction was conducted from the patient record form, investigation record and histopathological report by a trained physician. The semi-structured pre-tested questionnaire was verified and finalized by a group of an expert nephrologist and urologist for collecting the data. Another case record form to record the follow-up information was developed and pretested. The interview questionnaire was translated into the local language (Bengali) and afterward, it was translated back to English to check the translation consistency. Four hospital nurses were assigned to identify the participants based on eligibility criteria and collected the data from the hospitals. Four medical officers supervised the overall data collection, and a data management officer was responsible for checking the quality control of the data entry process.

Data analysis
Descriptive statistics were used to present the study findings. Frequency distribution was used to display the categorical variables. Mean and standard deviation was used for continuous variables. Total 17 patients underwent partial nephrectomy, and after the initial hospital discharge, three patients did not comply with the follow-up plan. Therefore, they were excluded from the study and intention to treat approach was used to analyze the exposure and outcome of interest. SPSS was used to enter the data and Stata version 13 (College Station, Texas, USA) was used for the analysis. Data management was performed by the residential medical officer of the urology department of the hospital.

Ethical approval
Written informed consent was collected from each participant at the time of enrolment and before surgery. Every participant was explained about the aims and objectives of the study. The study protocol was approved by the research review committee of the Dhaka Medical College Hospital, Dhaka, Bangladesh. Hospital permission to collect data were used maintaining the formal procedure.

RESULTS

General Characteristics of the participants
Table 1 showed that mean age of the patients was 56.0 ± 3.9 years. Most of the patients (64.3%) belonged from 51-60 years of age group. Among 14 participants, only three were female patients. About 18.0% of the patients were presented with acute loin pain, and the same percentage of patients reported presence of blood in the urine (hematuria). Among the other co-morbidities, this study found the frequency of hypertension and diabetes mellitus (DM) was 25.0% and 16.7%, respectively.

Tumour Characteristics of the participants
Table 2 represented the characteristics of a tumour among the participants. About six patients were presented with left-sided, and eight had right-sided renal mass. Five patients presented with renal mass from 4 cm to 7 cm in size and renal mass was situated in lower pole (57.1%).

| Tumour Characteristics of the participants | Table 2 | presented with renal mass from 4 cm to 7 cm in size and renal mass was situated in lower pole (57.1%). |
### Table 1 Distribution of participants according to age and clinical presentation

| Characteristics          | No. of patients (n=14) | Percentage |
|--------------------------|------------------------|------------|
| Age group, years         |                        |            |
| 40-50 years              | 2                      | 14.3%      |
| 51-60 years              | 9                      | 64.3%      |
| 61-70 years              | 3                      | 21.4%      |
| Mean (SD)                | 56.0 (3.9)             |            |
| Sex                      |                        |            |
| Male                     | 11                     | 68.7%      |
| Female                   | 3                      | 21.3%      |
| Clinical presentation*   |                        |            |
| Asymptomatic/incidental  | 8                      | 50.0%      |
| Loin pain                | 3                      | 18.8%      |
| Hematuria                | 3                      | 18.8%      |
| Loin pain and Hematuria  | 1                      | 6.3%       |
| Co-morbid disease*       |                        |            |
| Diabetes Mellitus (DM), yes | 2                  | 16.7%      |
| Hypertension, yes        | 3                      | 25.0%      |
| DM and Hypertension, yes | 2                      | 16.7%      |
| Chronic Kidney Disease, yes | 2                  | 16.7%      |

* The summation of clinical presentation and co-morbid disease condition is not equal to 100%

### Table 2 Distribution of patients according to tumour characteristics

| Tumour-related information          | No. of patients (n=14) | Percentage |
|-------------------------------------|------------------------|------------|
| Location                            |                        |            |
| Upper pole                          | 4                      | 28.6%      |
| Middle portion                      | 2                      | 14.3%      |
| Lower pole                          | 8                      | 57.1%      |
| Site of tumour                      |                        |            |
| Right sided                         | 8                      | 57.2%      |
| Left sided                          | 6                      | 42.8%      |
| Size of tumour                      |                        |            |
| Up to 4 cm                          | 9                      | 64.3%      |
| 4-7 cm                              | 5                      | 35.7%      |
| cm: Centimeter                      |                        |            |

### Surgical approach and procedure

Table 3 showed the operation related information for the patients that went through the retroperitoneal approach. Mean warm ischaemic time and cold ischaemic time was 2.3 and 14.4 minutes respectively for the operative patients. Average operative time was 90 minutes, and hospital stay was eight days. Catheter removal was advised on the second postoperative day.

### Table 3 Operation related information

| Operation related information          | Findings                  |
|---------------------------------------|---------------------------|
| The operative position of the patients | Right/left lateral        |
| Approach                               | Retroperitoneal            |
| Total operation time                  | Average 90 minutes (75-128 min) |
| Mean warm ischaemic time              | 2.3 ± 1.1 minutes          |
| Mean cold ischaemic time              | 14.5 ± 4.3 minutes         |
| Drain kept in situ                    | Average 4 days (± 2)       |
| Catheter removal                      | 2nd postoperative day      |
| Hospital stay                         | Average eight days (± 2)   |
**Histopathological investigation of the dissected tumour**

Table 4 revealed that all renal mass was proved to be malignant of which clear cell type was most common (70%), Fühman grade I, II and II was in 10, 3 and 1 cases respectively. The TNM staging was T1 N0M0, and surgical margin was evident in every situation.

| Variables                                      | Number | Percentage |
|------------------------------------------------|--------|------------|
| Types of tumour                                |        |            |
| Clear cell type RCC                            | 11     | 78.6%      |
| Papillary type of RCC                          | 2      | 14.3%      |
| Chromophobe type of RCC                        | 1      | 7.1%       |
| Fühman grade                                   |        |            |
| Grade I                                        | 10     | 71.4%      |
| Grade II                                       | 3      | 21.3%      |
| Grade III                                      | 1      | 7.1%       |
| Margin free from tumour (after partial nephrectomy) | 14     | 100%       |
| TNM Status (T1a N0 M0/T1b N0 M0/T1 N0 M0)      | 14     | 100%       |

**Follow up schedule and findings of the patients**

Follow-up status of the patients was updated in three months (1st follow up) and six months (2nd follow up) to evaluate the outcome of patients according to AUA guideline. Findings were gained after conducting history taking, clinical examination, and routine investigation. This study did not report any recurrence of tumour during the follow-up period.

**DISCUSSION**

This study found that partial nephrectomy might be a suitable method for the patients with renal cell carcinoma stage Ta. Based on several large retrospective series, and most recent evidence from a randomized controlled trial, partial nephrectomy has been recommended as a standard therapeutic method for organ-confined T1 renal masses (Butler, Novick, Miller, Campbell, & Licht, 1995; Lee et al., 2000; Lerner et al., 1996; Van Poppel et al., 2011). Though it was established that oncological outcome after partial nephrectomy was excellent for T1a group, however, several antecedent studies showed that partial nephrectomy could be safely performed with the similar oncological outcome for T1b renal cell carcinoma. For example, studies conducted by Leibovich et al. (Leibovich et al., 2004), Mitchell et al. (Mitchell et al., 2006), Becker et al. (Becker et al., 2006), Dash et al. (Dash et al., 2006) and Patard et al. (Patard et al., 2007) have compared both the outcome of partial and radical nephrectomy in patients with T1b tumour and they did not get significant differences. Moreover, Pahernik et al. showed that oncological outcome after performing partial nephrectomy was near similar for T1a and T1b tumour (Pahernik, Roos, Röhrig, Wiesner, & Thüroff, 2008).

Furthermore, one of the advantages of partial nephrectomy is that it can preserve the maximum amount of viable renal parenchyma. It has been linked to demonstrate the benefit of patients in improving their quality life expectancy (Link et al., 2005; Zaman, 2017).

Patients undergoing a radical nephrectomy have been shown to have a higher risk of subsequent development of chronic renal insufficiency, proteinuria, and metabolic acidosis as compared to partial nephrectomy (Lau, Blute, Weaver, Torres, & Zincke, 2000). Patients who underwent radical nephrectomy needs comparatively longer follow-up follow up period, which is cumbersome for remote
patients. One previous study suggested that radical nephrectomy might adversely influence long-term survival when compared with partial nephrectomy due to its high risk of cardiovascular morbidity and progressive end-stage of renal disease (Link et al., 2005). Study showed that partial nephrectomy is associated with higher health-related quality of life due to the benefit of preserved minimal renal function (Link et al., 2005).

In addition to the oncological efficacy of partial nephrectomy in treating T1BNO M0 masses, favorable outcomes of renal preservation have shown to promote health-related quality of life (HRQL) measures. Improved HRQL substantiate the premise that partial nephrectomy might be a preferred option for T1 tumours considering both patient and clinician perspective.

In this present study, the mean age of the patient was 56.0 ± 3.8 years with male patients predominant. Survey conducted by Margulis et al. found that mean age among their study participants was 59.9 ± 11 years, and Fernando et al. (Fernando et al., 2016) revealed mean age of 64.0 years in their study. However, a study conducted in Nepal reveals the mean age was 45.0 years where the study was comprised of eight participants (Gupta et al., 2014).

Warm ischaemic time and cold ischaemic time are considered as an essential factor for preservation of renal function. This study found that warm ischaemic time (WIT) was 2.3 ± 1.3 minutes and cold ischaemic time (CIT) was 14.4 ± 4.6 minutes. It is advised that WIT and CIT should be less than 20 minutes according to a new set of recommendations. Fernando et al. (Fernando et al., 2016) found a WIT of <20 min was recorded in 81% (176/218) and of 21-30 min in 18% (40/218) cases. The Nepal study showed that the mean warm ischaemic time was recorded in their series as 16.4 ± 7.8 minutes (Gupta et al., 2014). In our study, the average operation time was 90 minutes while the maximum time was 150 minutes for few cases. No blood transfusion was indicated in this study, and average hospital stay was 7 days. Fernando et al. in their research showed that their mean operative time was 2-3 hours and median hospital stay was 5 days (Fernando et al., 2016). The research done in Nepal had reported 5 days of hospital stay for the study participants (Gupta et al., 2014). Another study which was conducted by Margulis et al. (Margulis, Tamboli, Jacobsohn, Swanson, & Wood, 2007) showed surgical time for partial nephrectomy was 186.8 min.

In this study, partial nephrectomy was done with 1 cm margin, and the histopathology reports revealed that the surgical margin was free from tumour. After evaluating the Furhman grading system, we found that the number of patients with grade I, grade II, and grade III was 10, 3, and 1 respectively. A large portion (20-25%) of all renal masses finally was proved as benign, which was consistent with other study findings (Robson, 1963; Zaman, Hossain, Rahman, & Islam, 2017). However, in the current study, the histopathology report revealed malignancy in all cases, and clear cell type was the highest variety (78.57%). According to different research findings, clear cell type renal cell carcinoma accounts for most of the tumor ranging from 80-90% (Beldegrun, Tsui, deKernion, & Smith, 1999; Gill et al., 2003). Recent reports suggested that patients with renal mass treated with radical nephrectomy can develop renal insufficiency than patients treated with partial nephrectomy. Defining chronic renal insufficiency as a measurement of serum creatinine level >2 mg/dL (Margulis et al., 2007), investigators from the Mayo Clinic showed a higher cumulative incidence of renal failure in patients treated with radical nephrectomy as compared to the matched patients managed with partial nephrectomy (22.4% versus 11.6% in 10 years) (Lau et al., 2000). Similarly, at a median follow up 25 months, investigators from the Memorial Sloan-Kettering Cancer Center detected significant differences in mean postoperative serum creatinine among well-matched patients treated with radical and partial nephrectomy for treating renal cell carcinoma (1.5 versus 1.0 mg/Dl) (McKiernan, Simmons, Katz, & Russo, 2002). In our series, two patients had deve-
Adequate quality control of the data was one of the major advantages. However, serum creatinine was static for these patients during the first and second follow up period. Renal function status was regular after partial nephrectomy for rest of the patients irrespective of their metabolic condition.

This study reported that one patient developed superficial surgical site infection, which was managed conservatively with regular dressing and strict glycemia control. One patient had persistent hematuria for five days, and it was conservatively treated. In this study, follow up protocol for the patients was strictly maintained at three months and six months. In our series, this study showed zero reportable occurrences during nearly half-year follow up after going through the extensive investigation. Therefore, application of higher imaging technologies at the follow-up period is highly recommended for proper evaluation (Zaman, Hossain, Ahammed, & Ahmed, 2017). However, cost-effective surgery like partial nephrectomy in treating renal problems is recommended for the poor people living in countries where patient need to pay out of pocket expenditure (Zaman & Hossain, 2017).

This study has certain limitations. The participants were only the stage 1 (T1) group, and it was a single-hospital study. The follow-up period was short which did not allow the researcher to collect information after six months to follow up the RN outcome. Though it is recommended to follow up patients up to five years, this study took six months to follow up data as the patients were not convinced to revisit the hospital due to financial issues and non-re-appearance of their problem. As our patients were exposed to various medications and lifestyle after the initial hospital discharge, it was not possible to obtain medicine, food, and behavior related information from the participants. However, the data were derived from a large tertiary level hospital with good operative and investigation facility, which is a strength. The number of participants was quite large in comparison to previous studies. Adequate quality control of the data was one of the major advantages.

CONCLUSION

Partial nephrectomy can be considered as an effective treatment module for treating small renal cell carcinoma. The clinical and functional outcome of partial nephrectomy was excellent considering a short follow up period. Therefore, partial nephrectomy has the potential to replace radical nephrectomy for managing T1 tumours in the near future. However, there are some controversies regarding the oncological outcome for T1b neoplasms. More longitudinal studies are recommended to investigate the effect of partial nephrectomy for treating patients with T1b tumours.

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Author’s Contribution
Conception and design: MSM, HAA, MSA, ANMLH, MTB, AKMHS, SBZ
Acquisition of data and analysis: MSM, HAA, MSA, ANMLH, MTB, AKMHS, SBZ
Interpretation of data: MSM, HAA, MSA, ANMLH, MTB, AKMHS, SBZ

Conflict of Interests
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PREVALENCE AND PATTERN OF UTERINE BLEEDING AMONG BREASTFEEDING WOMEN USING PROGESTERONE-ONLY PILLS

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ABSTRACT
Background: Progesterone-Only Pill (POPs) is one of the ideal oral contraceptive methods for breastfeeding women. Discontinuation of POPs was mostly due to bleeding pattern disorders.
Objective: The purpose of this study is to identify the prevalence and pattern of uterine bleeding on breastfeeding women using contraceptive pills containing progesterone derivatives.
Methods: This study is a double blind block randomized controlled trial for the treatment group (levonorgestrel or lynestrenol pills) and non-randomized controlled trial for the control group, 6-8 weeks’ postpartum women, 20 to 35-year-old, and breastfeeding. Monthly follow up was done for 6 months. Analysis was done using survival analysis, X2, and Cox’s Proportional Hazard.
Results: A hundred and seven women were involved with a drop-out rate of 17.8%. Subjects characteristics were ≤32-year-old, multiparous, ever used contraception with birth spacing of >60 months. Spotting and amenorrhea was the most common pattern. Levonorgestrel causes bleeding/menstrual resumption sooner in breastfeeding women than Lynestrenol.
Conclusion: The most common uterine bleeding on women using Progesterone-only Pills were spotting and amenorhea. By recognizing such effects, for Indonesian women, POPs was expected to be produced in the country and can be included in the national family planning programs.

Keywords: progesterone-only pills, levonorgestrel, lynestrenol, bleeding patterns, breastfeeding

INTRODUCTION

Postpartum contraception is very important because it will increase the health of both mother and child by better managing pregnancy spacing (Phillips et al., 2015). Ideally, contraception starts before ovulation recurs. Ovulation may occur before the menstruation cycle returns so that it requires contraception with proper methods and time. Non-hormonal methods, including Lactation Amenorrhreal Method (LAM), become the first choice for breastfeeding women because it does not affect lactation, health and growth of the child. However, due to some medical or personal reasons, many women prefer hormonal contraception. LAM is difficult to implement because the coverage of exclusive breastfeeding in Indonesia and the world is still low (Ichsan, 2015). Women practicing...
exclusive breastfeeding in Indonesia was 40% (Susiloretni, Hadi, Prabandari, Soenarto, & Wilopo, 2015). WHO recommends exclusive breastfeeding coverage of up to 90% (Ichsan, 2015). The second preferred choice is the hormonal method which only contains progesterone because it is known that it does not have negative effects on lactation and the child, even allegedly increasing the volume of breast milk (Espey, Ogburn, Leeman, Singh, & Schrader, 2012; Phillips et al., 2015). Hormonal methods containing estrogen become the last choice because it is known that it decreases the production of breast milk, affects the duration of breastfeeding period, and has negative effects on infant growth (Espey et al., 2012).

Hormonal contraception was designed to change ovarian function, prevent ovulation by suppress endogenous menstrual cycle. Inhibition of ovulation, thickening of the endometrial and cervical mucus is largely the effect of progestin and depends on the amount of dose used (De Melo, 2010; Edelman, Cherala, & Stanczyk, 2010; Freeman & Shulman, 2010). Thickening of the cervical mucus is intended to inhibit sperm penetration (Zigler & McNicholas, 2017).

Progesterone Only-Pill (POPs) or minipill is a birth control pill which only contains progestin in low dosages, is proven to be reversible and effective for breastfeeding women (Phillips et al., 2015). Levonorgestrel (LNG) and Lynestrenol are synthetic progestin commonly used. Unfortunately, menstrual irregularity and menstrual pattern disorders are often the primary causes to discontinue using it (d'Arcangues, Jackson, Brache, & Piaggio, 2011; Freeman & Shulman, 2010; Kaneshiro, Edelman, Carlson, Nichols, & Jensen, 2012). Twenty percent of women using POPs have amenorrhea, 40% have regular bleeding and the remaining 40% have irregular bleeding (Busby, 2016). Twenty percent women using POPs experienced amenorrhea, 40% had irregular bleeding and 40% had unscheduled bleeding (Busby, 2016). Breastfeeding women in the Family Planning program do not have choices in hormonal pills. All types of POPs distributed in Indonesia have not been part of the Family Planning program due to their relatively high prices. This study is aimed at identifying the effects of progesterone pill on the bleeding pattern in breastfeeding women in Indonesia.

**METHODS**

**Study design**

This study was a double-blind block randomized control trial for treatment group (which received LNG or Lynestrenol pill) and a non-randomized control trial for control group (which used IUD). Subjects were observed up to 6 months. Follow-up visit was performed at every 26 days - 1 month. Each follow-up visit included physical examination for subject and her baby, give the new blister pills and daily cards, as well as interviews; consisting of questions about the use of pills, observations of adverse events, history of menstruation or bleeding outside the menstrual period in the previous month, and breastfeeding process. The flow of the study is shown in Figure 1.

**Sample and setting**

This study was conducted at six health care centers, in two district of Yogyakarta province, Indonesia, from June 2012 to July 2013. Subjects were women aged 20-35 years, 6-8 weeks of postpartum, still breastfeeding, willing to use Progesterone Only Pills or used IUD, met the inclusion and exclusion criteria. The dependent variable was bleeding pattern, the independent variables were the use of LNG pill, Lynestrenol pill, and IUD, and confounding variables were body mass index/BMI, breastfeeding compliance, and status.

**Data analysis**

Data analysis consisted of univariate analysis by considering frequency distribution and percentage; bivariate analysis using survival analysis, and multivariate analysis using Cox's Proportional Hazard Regression with Time-Varying covariate, with a significance level of p<0.05 and 95% Confident Interval (CI).
Number of registered postpartum women giving birth in facilities  
\( n = 221 \)

- Not visiting the facilities \( n = 91 \)

Visit again during 4-8 weeks of postpartum  
\( n = 130 \)

- Excluded = 8

Meeting the Inclusion  
\( n = 122 \)

- Unwilling to participate = 15

Willing to participate in the research  
\( n = 107 \)

Randomization

Recruitment of B (LNG) Pill  
\( n = 36 \)

- Follow up 1; \( n = 31 \)
  - Lost to follow-up \( n = 5 \)
- Follow up 2; \( n = 30 \)
  - Lost to follow-up \( n = 1 \)
- Follow up 3; \( n = 29 \)
  - Lost to follow-up \( n = 1 \)
- Follow up 4-6; \( n = 29 \)
  - Lost to follow-up (-)

Recruitment of A (Lynestrenol) Pill  
\( n = 39 \)

- Follow up 1; \( n = 34 \)
  - Lost to follow-up \( n = 5 \)
- Follow up 2; \( n = 33 \)
  - Lost to follow-up \( n = 1 \)
- Follow up 3; \( n = 31 \)
  - Lost to follow-up \( n = 2 \)
- Follow up 4; \( n = 30 \)
  - Lost to follow-up \( n = 1 \)
- Follow up 5-6; \( n = 30 \)
  - Lost to follow-up (-)

Recruitment of Control (IUD)  
\( n = 32 \)

- Follow up 1; \( n = 31 \)
  - Lost to follow-up \( n = 1 \)
- Follow up 2; \( n = 29 \)
  - Lost to follow-up \( n = 2 \)
- Follow up 3 – 6; \( n = 29 \)
  - Lost to follow-up (-)

**Figure 1** Recruitment and Follow up Diagram
Ethical consideration
This research has obtained an Ethical Clearance Certificate from Medical Research Ethics Commission, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada with Ref: KE/FK/484/EC reference number dated July 5th 2012.

RESULTS
The number of subjects at the beginning of the study was 107 women and decreased to 88 until research completed. Table 1 shows the characteristics of subjects.

| Table 1 Characteristic of Socio Demographic and Reproductive Health |
|------------------------------------------------|
| Variable | Type of Contraception | Total | p |
|          | LNG Pill | Lynestrenol Pill | IUD/Control | n | % | n | % | n | % |
| Age (years old) |          |          |          |    | |    | |    | |    | |    | |
| ≤ 32     | 23 63.9  | 31 79.5  | 26 81.3  | 80 74.8 | 0.18 |
| > 32     | 13 36.1  | 8 20.5   | 6 18.8   | 27 25.2 |
| Education |          |          |          |    | |    | |    | |    | |    | |
| Primary  | 16 44.4  | 12 30.8  | 11 34.4  | 39 36.5 | 0.54 |
| Secondary| 17 47.2  | 24 61.5  | 16 50.0  | 57 53.3 |
| Higher   | 3 8.3    | 3 7.7    | 5 15.6   | 11 10.3 |
| Occupation |          |          |          |    | |    | |    | |    | |    | |
| Housewife/not working | 25 69.4 | 28 71.8 | 25 78.1 | 78 73.0 | 0.47 |
| Employee | 9 25.0   | 8 20.5   | 7 21.9   | 24 22.4 |
| Self-employed | 2 5.6   | 2 5.1    | 0 0.0    | 4 3.74 |
| Farmer   | 0 0.0    | 0 0.0    | 2 6.5    | 2 2.1  |
| Number of Live Birth (parity) |          |          |          |    | |    | |    | |    | |    | |
| Primiparous | 13 36.1 | 17 43.6 | 12 37.5 | 42 39.3 | 0.78 |
| Multiparous | 23 63.9 | 22 56.4 | 20 62.5 | 65 60.8 |
| Birth Spacing (months) |          |          |          |    | |    | |    | |    | |    | |
| 13 – 24  | 3 13.0   | 3 13.6   | 4 20.0   | 10 15.4 | 0.71 |
| 25 – 36  | 2 8.7    | 0 0.0    | 2 10.0   | 4 6.2  |
| 37 – 48  | 2 8.7    | 5 22.7   | 2 10.0   | 9 13.9 |
| 49 – 60  | 4 17.4   | 4 18.2   | 5 25.0   | 13 20.0 |
| >60      | 12 52.2  | 10 45.5  | 7 35.0   | 29 44.6 |
| Last type of contraception used |          |          |          |    | |    | |    | |    | |    | |
| IUD      | 0 0.0    | 1 5.6    | 3 15.8   | 4 7.4  | 0.47 |
| Injection | 12 70.6 | 9 50.0   | 8 42.1   | 29 53.7 |
| Pill     | 3 17.7   | 5 27.8   | 3 15.8   | 11 20.4 |
| Condom   | 2 11.8   | 3 16.7   | 4 21.1   | 9 16.7 |
| Others   | 0 0.0    | 0 0.0    | 1 5.3    | 1 1.9  |
| Height (mean ± SD) | 153.0 ± 6.0 | 152.8 ± 5.3 | 153.8 ± 5.8 | 153.2 ± 5.6 | 0.73 |
| weight (mean ± SD) | 53.5 ± 7.6 | 52.6 ± 9.8 | 55.5 ± 10.6 | 53.8 ± 9.3 | 0.43 |

| Table 2 Results of χ² analysis of subjects' complaints based on the type of pills during observation |
|------------------------------------------------|
| Type of Pill Complaint | LNG Pill | Lynestrenol | IUD/Control | Total | χ² | p |
| Dizzy/headaches | 15 42.9 | 19 50.0 | 3 7.7 | 37 33.0 | 17.79 | 0.00* |
| Nauseous/vomit | 6 17.1 | 1 2.6 | 1 2.6 | 8 7.1 | 7.68 | 0.02* |
| Chest pain | 1 2.9 | 1 2.6 | 0 0.0 | 2 1.8 | 1.09 | 0.58 |
| Vaginal discharge | 0 0.0 | 2 5.3 | 17 43.6 | 19 16.9 | 30.47 | 0.00* |
| Facial spots / pimplies | 2 5.7 | 0 0.0 | 0 0.0 | 2 1.8 | 4.48 | 0.11 |
| Weight changes | 3 8.6 | 1 2.6 | 0 0.0 | 4 3.6 | 4.08 | 0.00* |
| Changes in menstrual patterns | 13 36.1 | 3 8.1 | 5 12.8 | 21 18.8 | 10.77 | 0.01* |
| Spoting | 10 28.6 | 14 36.8 | 14 35.9 | 38 33.9 | 0.66 | 0.72 |
| other disorders | 6 16.2 | 5 13.9 | 8 20.5 | 19 17.0 | 0.60 | 0.74 |
Spotting, dizziness/headache, and changes in menstrual patterns were 3 complaints of most subjects. Most complaints to the subjects of LNG pills and Lynestrenol pill were dizziness/headache, while the IUD was vaginal discharge (Table 2). Of the 19 subjects (17.8%) who dropped out, 5 (4.7%) stated health reason of and 14 (13.1%) for personal reasons; 7 (19.4%) used LNG pill, 9 (23.1%) used Lynestrenol pill, and 3 (9.4%) used IUD. In regard to health reason, among LNG pill users, 2 subjects (5.6%) complained about nausea and vomiting and 1 (2.8%) always felt the pain of both legs after 1 hour taking the pills, while 1 Lynestrenol pill user and 1 IUD user complained about changes in the menstrual pattern (2.6% and 3.1%). In regard to personal reason, the respondent worked through the night was the most common reason (3.7%) making it difficult to join the next follow-up.

Table 3 The results of the analysis of survival time and the statistical test of Cox's Proportional Hazard Regression

| Variable | Survival time | HR | 95% CI | P |
|----------|---------------|----|--------|---|
| **Contraception** | | | | |
| IUD | 13.8 | 17.0 | 1 | 1 | 0.16 |
| LNG Pill | 11.3 | - | . | 0.72 | 0.31 - 1.64 |
| Lynestrenol Pill | - | - | . | 0.41 | 0.15 - 1.06 |
| **BMI (kg/m²)** | | | | |
| <18.5 | | | | |
| IUD | 8.3 | 8.3 | 1 | - | 0.46 |
| LNG Pill | - | - | . | . | - |
| Lynestrenol Pill | 8.7 | - | . | 0.40 | 0.02 - 6.48 |
| ≥18.5 | | | | |
| IUD | 13.8 | 17.0 | - | 0.96 | 0.12 - 7.34 |
| LNG Pill | 11.3 | - | . | 0.69 | 0.08 - 5.47 |
| Lynestrenol Pill | - | - | . | 0.39 | 0.04 - 3.38 |
| **Compliance** | | | | |
| Compliant | | | | |
| LNG Pill | 26.8 | - | . | 2.62 | 0.23 - 29.07 |
| Lynestrenol Pill | - | - | . | 1 | 1 |
| Non compliant | | | | |
| LNG Pill | 10.4 | 25.6 | - | 5.81 | 0.71 - 47.39 |
| Lynestrenol Pill | 8.7 | - | . | 3.97 | 0.23 - 29.07 |
| **Breastfeeding Status** | | | | |
| Exclusive | | | | |
| IUD | 10.0 | 17.0 | - | 1 | - | 0.15 |
| LNG Pill | - | - | . | 0.16 | 0.02 - 1.28 |
| Lynestrenol Pill | 9.1 | - | . | 0.48 | 0.10 - 2.27 |
| Non-exclusive | | | | |
| IUD | 13.8 | 16.3 | - | 0.83 | 0.30 - 2.29 |
| LNG Pill | 10.4 | 25.6 | - | 1.06 | 0.39 - 2.83 |
| Lynestrenol Pill | - | - | . | 0.33 | 0.10 - 1.12 |

Stratified analysis was performed to further analyze the effects of BMI, compliance status, and breastfeeding status on bleeding pattern based on the type of contraception. The results of BMI analysis indicated that in the category of poor nutrition and good nutrition IUD made menstruation faster to reoccur (HR=1 and HR=0.96 respectively), in the category of compliant and non-compliant, LNG had greater probability of 2.62 and 5.81 times
(HR=2.62 and HR=5.81), while for the exclusive breastfeeding status-IUD and nonexclusive breastfeeding-LNG had greater probability (HR=1 and HR=1.06 respectively) (Table 3).

The results of multivariable analysis, with and without compliance, indicated that there was no significant effect of the use of LNG pills, Lynestrenol pill, and IUD, BMI, compliance and status breastfeeding on the bleeding/menstrual resumption in breastfeeding women (Table 4).

### Table 4 Results of analysis of Cox's Proportional Hazard with Time-Varying Covariate

| Variable               | Model 1 HR (95% CI) | Model 2 HR (95% CI) | Model 3 HR (95% CI) |
|------------------------|---------------------|---------------------|---------------------|
| **Usage**              |                     |                     |                     |
| IUD                    | 1                   | 1                   | 1                   |
| LNG Pill               | 0.71 (0.30-1.63)    | 0.71 (0.30-1.62)    | 0.72 (0.31-1.64)    |
| Lynestrenol Pill       | 0.38 (0.14-1.02)    | 0.38 (0.14-1.01)    | 0.41 (0.15-1.06)    |
| **BMI (kg/m^2)**       |                     |                     |                     |
| ≥ 18.5                 | 1.04 (0.23-4.59)    |                     |                     |
| <18.5                  | 1                   |                     |                     |
| **Breastfeeding Status**|                     |                     |                     |
| Non-exclusive          | 1.32 (0.61-2.82)    | 1.32 (0.62-2.80)    |                     |
| Exclusive              | 1                   |                     |                     |
| **-2 log likelihood**  | 237.61              | 237.61              | 238.15              |
| **N**                  | 88                  | 88                  | 88                  |

HR=Hazard Ratio, CI=Confident Interval

Bleeding patterns shown in this study were amenorrhea, spotting, and irregular bleeding. Amenorrhea occurred throughout the observation. Amenorrhea and inter-menstrual bleeding are bleedings which are commonly experienced by breastfeeding women who use POPs. Clinically, IUD, the variables of BMI 18.5kg/m2 (good nutrition), status of non-compliance and non-exclusive breastfeeding affected the bleeding or menstrual resumption compared to the comparative variables, although statistically not significant.

**DISCUSSION**

This study shows that the use of progesterone pill (hormonal) was likely to cause amenorrhea rather than IUD (non-hormonal). The use of hormonal contraceptive was likely to cause amenorrhea rather than non-hormonal, especially in breastfeeding women. Baby sucking during breastfeeding increases prolactin levels, which allegedly interfere with the release of the Gonadotrophin Releasing Hormone (GnRH) by the hypothalamus by increasing the production of hypothalamic β-endorphin. Disorders of the release of GnRH affect the release of Luteinising Hormone (LH) from the pituitary that play a role in the maturation of follicles in the ovaries so that ovulation does not occur (Edelman et al., 2010). In breastfeeding women, mini pills cooperate with prolactin to suppress ovulation process, which effectively enhances the protection (Speroff & Darney, 2010). IUD works mainly by preventing fertilization of the egg by the sperm.

The results of the study showed women with higher BMI of good nutritional status had HR=1:20, that 1.2 times of the probability of bleeding or menstruation to recur. BMI is known to affect amenorrhea. Women with malnutrition experienced amenorrhea longer than those with good nutrition (Dwivedi & Dixit, 2012). There were two mechanisms that might cause this condition: lack of nutrition directly affects female reproductive system and cause delays in the menstrual resumption; and indirectly through the process of breastfeeding, women with malnutrition will produce a little amount of milk so their babies will suck more intensely to get adequate nutrition. Women with heavier weight have lower level of LNG than women who are lighter; it is allegedly related to steroid absorption by fat tissue or dilution factors associated with blood volume.
Therefore, they tend to have irregular and frequent bleeding, while women with lighter weight tend to experience amenorrhea (Shoupe, Ballagh, & Mishell Jr, 1992). This can be taken into consideration when giving contraception that LNG should not be given to women with heavier weight or BMI because it would tend to disrupt the bleeding pattern.

This study shows that non-compliant subjects 2.85 times faster probability to experience the bleeding or menstrual resumption. This is related to the theory that indiscipline, either postponement or discontinuation of 1 or 2 days, will decrease its effectiveness and can cause menstrual disorders, including irregular bleeding, short or very long menstrual cycle, spotting, very long period of menstruation or not having menstruation at all (Bachmann & Korner, 2007).

The analysis of this study indicates that the status of non-exclusive breastfeeding is not likely to cause the bleeding or menstrual resumption by 1.14 times faster than exclusive breastfeeding. Exclusive breastfeeding is known to prolong the duration of amenorrhea in breastfeeding women. The increase in prolactin levels during breastfeeding process will decrease with the weaning or introduction of supplementary food and will cause ovulation in 14-30 days (King, 2007).

The stratification analysis indicated that IUD and LNG pill cause the bleeding/menstrual resumption sooner in breastfeeding women than Lynestrenol pills. Bleeding happens because IUD could be a reaction of the endometrium due to the insertion of IUD. Pharmacologically, LNG has stronger androgenic properties than Lynestrenol so that it tends to cause bleeding. A dose of LNG do not proven to be able to eliminate the unscheduled bleeding on women who start to use a continuous oral contraceptives pills (Kaneshiro et al., 2012). Study by LNG implant user showed an abnormal fragility on the endometrial vessel (Dinh, Sriprasert, Williams, & Archer, 2015).

The results of multivariable analysis showed that there was no significant difference in the effects of the use of contraceptives (LNG pill, Lynestrenol pill, and IUD), BMI, compliance, and breastfeeding status on the bleeding/menstrual resumption in breastfeeding women. However, further study with longer follow up period is required to investigate the long-term effect of POPs use on breast milk quality and maternal health.

Knowledge, information, religion, perceptions, socio-economic status, ethnicity and age are factors that influence contraceptive choice (Belfield, 2009). Women need to understand that bleeding disorders experienced when using hormonal contraceptives do not endanger health. Before giving education about bleeding disorders, health workers need to explain in advance the normal menstrual cycle. The knowledge about menstruation need to be improved since previous study found that more than half women did not know about the normal menstruation cycle (Gustina & Djannah, 2015). In addition, a better understanding of the work of progestins in the body can enhance its safety and effectiveness in medical interests (Taraborrelli, 2015). It is unfortunate that this progestin contraception is not much in demand. As a second-line method after combination pills, sterilization and IUD, this method is preferable because it does not contain estrogen. Thus, it is expected that POPs which contains Levonorgestrel (LNG) or Lynestrenol can be produced in generic manner in the country and can be used as a national program for breastfeeding women.

CONCLUSION

Levonorgestrel pill caused the bleeding or menstrual resumption sooner in breastfeeding women than Lynestrenol pill. There was no difference in the effects of the use of birth control pills that contain Lynestrenol and LNG as well as the IUD, BMI, compliance, and breastfeeding status on the bleeding pattern and the bleeding/menstrual resumption in breastfeeding women. Suggestions that can be
offered are as follows: 1) Socializing the use of progestin pill containing Levonorgestrel and Lynestrenol including the possible side effects through Communication, Information, and Education to prospective acceptors; 2) In case of a future study, participant retention strategies will need to be considered to reduce the number of lost to follow up subjects in order to increase the quality of the study.

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DEVELOPING HOLISTIC CARE MODEL: THE PHYSICAL WELLBEING OF ELDERLY BASED ON SOCIAL SUPPORT AND CHARACTERISTIC

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ABSTRACT

Background: Elderly experiences with degenerative process in their life span and physical condition as well as their ability to adopt with their environment. Those conditions will influence the achievement of elderly wellbeing.

Purpose: This study aims to examine physical wellbeing in elderly based on social support and elderly characteristic.

Method: This study employed cross-sectional survey design. The population was elderly who live in east Surabaya. One hundred and ten of elderly were recruited. Their age was more than sixty years old, living with their family and under Medokan Ayu Public Health Center supervision. Multi stage random sampling was performed. The research instrument was physical wellbeing including elderly autonomy, cognitive, complaining about physical and disease as well. Structural Equation Modeling with Partial Least Square (SMART PLS) was used to analyze the data.

Results: The research results showed that majority of emotional support in social support variable was good (98%). The majority of instrumental support was good (88.18%). Social wellbeing has significant relationship with the elderly physical wellbeing (p 0.312, t-statistic: 4.420, t-table: 1.65), elderly characteristic of holistic care (0.178, t-statistic: 2.422, t-table: 1.65), and elderly characteristic of physical health (0.140, t-statistic: 1.790, t-table: 1.65).

Conclusion: Social support influences the physical wellbeing of elderly.

Keywords: physical wellbeing, social support, and characteristics of elderly

INTRODUCTION

In line with the increasing life expectancy, there will be changes in age structure of the population by affecting all aspects of life and health problems in the elderly (Indonesian Ministry of Health, 2013). The reality of elderly people experiencing aging process certainly has an impact on various aspects of life, both social, economic, and especially health, because the more age, the organ function will decrease due to both natural factors and disease (Indriana, Desiningrum, & Kristiana, 2011). Various problems that faced by the elderly include physical, mental and social changes Elderly vulnerable to social problems can affect the achievement of the wellbeing of the elderly (Kuncoro, 2002). Some elderly people become increasingly deteriorated in terms of psychological and physical as well as social interactions.

One of the factors that trigger the emergence of problems in elderly such as depression in elderly among them due to changes in physical condition, social status, psychosocial changes, and other biological changes resulting from aging. The elderly is depressed and not getting...
A right way intervention, it can have an impact on the more advanced conditions such as physical pain, drug abuse, alcohol and nicotine, and even worse impact on the health of the elderly (Fiske, Wetherell, & Gatz, 2009). The impact on the increasing health problems, especially the incidence of chronic and degenerative diseases, so the need for long-term and sustainable health services is increasing (Robert, 2014). The results of Basic Health Research in 2013, shows that the pattern of disease in the elderly were hypertension 57.6%, arthritis 51.9% and stroke 46.1% followed by dental and mouth health problems 19.2%. While the most common cause of death in the elderly from the 2011 National Board of Health Research and Development Reports in 15 districts/ cities was 24.6% Stroke and 12% ischemic heart disease (Indonesian Ministry of Health, 2013). The high incidence of disease in the elderly shows the low level of physical wellbeing of the elderly.

Currently the government has implemented various programs to improve the physical wellbeing of the elderly, among others promotive efforts are through supplementary feeding for the elderly, established Posyandu for elderly, preventive efforts that can be done is monitoring elderly health, performing early checks, and monitoring health periodic (Erfandi, 2014; Stanhope & Lancaster, 2004). Curative efforts are elderly health services in hospitals, rehabilitative efforts rehabilitative programs in elderly infectious diseases and non-communicable diseases. However, this still cannot be maximized to fulfill the hope that physical wellbeing of elderly fulfilled. So, it is necessary to do the study deeper of other factors that can support the physical wellbeing of the elderly. One of factor is social support of the elderly (Adib, 2008; Kozier, 2008).

METHODS

Study design
This study was cross-sectional survey design. This research is part of a big research in developing holistic care model. This research is for discovering of elderly physical wellbeing based on elderly’s characteristic and social support. The characteristic of elderly are age, gender, occupation, education, and marriage status.

Selection and description of participants
The population was elderly who live in east Surabaya. They are elderly with 60 years old is the minimum age, elderly who live with their family around the area of Medokan Ayu Public Health Center, Rungkut Sub-district, Surabaya District, Indonesia. There were 110 samples selected using simple random sampling.

Instrument
The research instrument was physical wellbeing including elderly autonomy, cognitive, complaining about physical and disease as well instrument which related to physical wellbeing using closed instruments which the total are 6 items measured 1) Cognitive ability, 2) Independency, 3) Complaints perceived. The results of the scores is 1-4, with the higher score indicates the physical health of the disorder. Cognitive instruments are using MMSE with criteria Cognitive function, none, low, medium, severe. Independence Criteria categorized Independence low, medium, independent. Complaints are derived by the elderly with criteria: none, moderate, severe. Independence Criteria categorized Independence low, medium, independent. Complaints are derived by the elderly with criteria: none, moderate, severe. Instruments for social support using closed-ended instruments of instruments support include the availability of support facilities that received by the elderly, information support is an associated instrument of health information obtained, obtained from available health services such as basic or so-called health services with Primary Health Care, the intensity of providing health information, as well as matters relating to information on the health condition of the elderly, and emotional support is an instrument related to emotional support provided by the patient's family, as well as the distressed person in the elderly life, as for the total number questionnaire is a number of 15 positive questions, with Likert scale assessment of choice answers: 1. None 2. sometimes 3. Often.
**Statistical method**

Further, the collected processed by using the help of statistical programs. The alpha that being used is valued 0.05. The value of loading factor is 0.3, descriptive statistic that being used is using frequency distribution to explain the characteristics of the sample and research variables. Furthermore, the results that fulfill the criteria are analyzed by using Structural Equation Modeling with Partial Least Square (SMART PLS). To find out the components that build Holistic care. On this occasion, the researcher uses the processed data to know the effect of social support in Holistic Care Model categorized based on the elderly characteristic in Medokan Ayu Public Health Center, Rungkut Sub-district, Surabaya District, Indonesia.

**RESULTS**

This study aimed to examine the physical wellbeing in elderly based on social support and elderly characteristics in Medokan Ayu Public Health Center, Rungkut Sub-district, Surabaya District, Indonesia. The results of this study were presented as the followings:

**Elderly Characteristic**

The total number of elderly persons are 110 people according to the existing criteria of elderly residing in Rungkut sub-district and belonging to Medokan Ayu Primary Health Care in Rungkut Sub-district, Surabaya District, East Java.

| Characteristics          | N   | %  |
|-------------------------|-----|----|
| Age                     |     |    |
| 60-64                   | 31  | 28 |
| 65-69                   | 47  | 42 |
| 70-74                   | 31  | 28 |
| 75-79                   | 7   | 6  |
| 80-84                   | 3   | 2  |
| 85-89                   | 2   | 2  |
| Gender                  |     |    |
| Male                    | 69  | 63 |
| Female                  | 41  | 37 |
| Maritas status          |     |    |
| Single                  | 5   | 4.54|
| Married                 | 94  | 85.4|
| Divorced                | 11  | 10 |
| Education               |     |    |
| Not finished primary school | 5 | 4.54|
| Primary school          | 25  | 22.72|
| Secondary school        | 16  | 14.54|
| High school             | 25  | 22.7|
| Undergraduate/graduated  | 39  | 35.5|
| Occupation              |     |    |
| Not work                | 73  | 66.36|
| Work                    | 37  | 33.64|
| Level of Spending       |     |    |
| 0-40%                   | 50  | 45.45|
| 40-60                   | 46  | 41.81|
| 60%                     | 14  | 12.72|

The Table 1 shows that some of the elderly are between the age of 65-69 years old as in 42%, and 69 (63 %) are female, 94 persons (85.4%) are married, mostly graduated from the highest education as in 39 persons (35.5%), unemployed 66.36%. Majority of elderly spend their 0-40% of their income (50%). While Table 2 shows that the physical wellbeing of elderly is consist of elderly independency which is mostly have ability to have daily activity as many as 45 persons (40.9 %), minor physical complaints of 42 people (38%), cognitive function with mild disturbance as much 42 people (38%), whereas diseases include chronic diseases, among others, diabetes mellitus, nerve function disturbance number 60 people (54%).
Description of Physical Wellbeing

Table 2 Description of Physical Wellbeing (n=110)

| Variabel                      | Level       | N  | %   |
|-------------------------------|-------------|----|-----|
| Independency                  | Low         | 18 | 16.3|
|                               | Average     | 37 | 33.6|
|                               | Independent | 45 | 40.9|
| physical complaints           | None        | 20 | 18.1|
|                               | Low         | 42 | 38  |
|                               | Average     | 0  | 0   |
|                               | Severe      | 38 | 34  |
| cognitive function            | None        | 20 | 18  |
|                               | Low         | 42 | 38  |
|                               | Average     | 0  | 0   |
|                               | Severe      | 38 | 34  |
| Illness                       | None        | 35 | 32  |
|                               | Acute Illness| 15 | 14  |
|                               | Chronic Illness | 60 | 54  |

Description of Social Support

The Table 3 shows that the elderly in achieving physical well-being has good emotional support of 98 people (89.18%), good instrument support 87 people (79.9%) and information support for 98 people (89.18%).

Table 3 Social support description (n=110)

| Variabel                      | Level       | N  | %   |
|-------------------------------|-------------|----|-----|
| Instrumental Support         | Low         | 2  | 1.81|
|                               | Average     | 11 | 10  |
|                               | Good        | 97 | 88.18|
| Information Support          | Low         |   |    |
|                               | Average     | 3  | 1.82|
|                               | Good        | 107| 98.18|
| Emotional support            | Low         |   |    |
|                               | Average     | 3  | 1.82|
|                               | Good        | 107| 98.18|

Validity and Reliability

Table 4 Factors, Average Varians Extracted and Composite Reliability from Final Measurement Model

| Factor                     | Indicator            | Convergent test of validity | AVE | Composite realibility |
|----------------------------|----------------------|------------------------------|-----|------------------------|
| Elderly Characteristic     | Expense Rate         | 1.000 Valid                  | 1.000| 1.000                  |
| Social support             | Emotional support    | 0.739 Valid                  | 0.505| 0.671                  |
|                            | Instrumental support | 0.589 Valid                  |      |                        |
|                            | Information support  | 0.575 Valid                  |      |                        |
| Physical health            | Physical complaints  | 0.882 Valid                  | 0.779| 0.875                  |
|                            | Illness              | 0.883 Valid                  |      |                        |
Relationship of Social Support with Physical Well-Being in Holistic Care Model

Table 5 shows that social support has an influence coefficient of 0.312; t statistics 4.420 and Characteristics of the elderly have a coefficient of influence 0.178, t statistics 1.65 states that the two factors contribute to the model of holistic care of the elderly.

| The influence of exogenous factors to endogenous factors | The coefficient of influence | t-statistics | t-table | Test results |
|----------------------------------------------------------|------------------------------|--------------|---------|--------------|
| Social Support to Physical Health                        | 0.312                        | 4.420        | 1.65    | Significant  |
| Elderly Characteristics of Holistic Care                  | 0.178                        | 2.422        | 1.65    | Significant  |
| Elderly Characteristics of Physical Health               | 0.140                        | 1.790        | 1.65    | Significant  |

DISCUSSION

Elderly Characteristic
Based on table 1. From the number of elderly people, 110 people in line with existing criteria which are elderly residing in Rungkut Sub-district and included in the area of Medokan Ayu Public Health Center, Rungkut Sub-district, Surabaya District, East Java, Indonesia obtained data as follows, some elderly aged 65-69 as the blueprint is 42%, the number of female sex 69 people (63%), married status 94 people (85.4%), most college education 39 people (35.5%), not working 66.36% Majority of elderly spend their 0-40% of their income (50%).

Age elderly 65-69 is group of elderly early, at this age elderly in general still active and can conduct everyday activities. Married elderly status allows elderly to get support from spouses to keep running their lives. High education provides its own assessment of the elderly, so that the elderly can provide life experiences in the younger generation. In the study obtained elderly data in daily economic expenditure able to save 0-40% of its finances. In this case it appears that the elderly can manage their daily expenses. The source of living expenses based on interview data as the elderly gets from 35% pension, part of the giving of children and relatives of 15% and the rest of the elderly conduct their own business by selling food or other business.

The presence of income in old age gives confidence to the elderly, because the elderly can still be meaningful to the surroundings. Elderly does not rely on their children or relatives (Ottenbacher, 2008; Papalia, Olds, & Feldman, 2007). In some studies, in the United States, 6 found financial support in the elderly is part of social security. Since 2007 data in the USA has undergone some improvements that the elderly began to work to meet their social security. So, it can be said that to make the elderly is safe need a good financial planning. Such finance is indeed necessary to meet the needs of elderly life. In the Era of the future, the elderly should conduct a plan of activities related to finance (Cavanaugh & Blanchard-Fields, 2018).

The Physical Wellbeing
The physical state of the elderly includes physical strength, sensory, potential and intellectual capacity begins to decline at some stage. The aged must adapt again with his helplessness. Physical degeneration is characterized by several diseases such as disorders of the blood circulation, joints, respiratory system, neurologic, metabolic, neoplasm and mental (Pelzang, 2010; Santrock, 2004). The physical ability of the elderly is related to carrying out the fulfillment of daily needs (Activity Day Living) (Potter & Perry, 2009). This will have an impact on biological well-being, expected by the decline of the elderly physically still able to move and be independent. Based on the results of research as many as 110 elderlies assessed the
According to Orem in the theory of nursing, independence in the ADL (Activity Daily Living) itself is an activity doing daily routine work. ADL can be disrupted by several things such as decreasing ADL in the elderly (Fiske et al., 2009; Ottenbacher, 2008; Santrock, 2004). Factors affecting ADL reduction are physical conditions such as chronic disease, eye and ear disorders, mental capacity, mental status such as sadness and depression, acceptance of limb function, and support of family members. According to Orem in the theory of nursing, self-care is an activity and initiative of the individual itself to meet and maintain their life, the majority of the Elderly have a good degree of independence of 40.9%. Most of the elderly have mild physical complaints of 38%. Most of the elderly have no mild cognitive impairment of 38%. And most of them suffer from chronic illnesses of 45%.

Decreased motor ability in the elderly is caused among other physical causes that affect various changes in motor ability include decreased strength and energy, which usually accompanies physical changes that occur due to age, decreased muscle hardness, strength and joints, trembling in the hands, head, and lower jaw (Papalia et al., 2007). The psychological causes that affect change in motor skills come from awareness of degeneration and inferiority compared to a younger person in terms of strength, speed, and skill (Heaney & Israel, 2008). Emotional pressures derived from psychological causes can accelerate changes in motor skills or decrease motivation to try to do something that can still be done (Adib, 2008; Cavanaugh & Blanchard-Fields, 2018). The changes in motor physical condition can mean as a functional limitation of the body. Functional limitations are a result of sick or illness (Fiske et al., 2009; Potter & Perry, 2009). The physical condition of elderly that free from physical complaints, chronic diseases and psychological elderly will be influential in everyday activities. It will be improved the wellbeing of elderly. Seniors who have good health status can improve social welfare so that the elderly are independent.

Independence in the ADL (Activity Daily Living) itself is an activity doing daily routine work. ADL can be disrupted by several things such as decreasing ADL in the elderly (Fiske et al., 2009; Ottenbacher, 2008; Santrock, 2004). Factors affecting ADL reduction are physical conditions such as chronic disease, eye and ear disorders, mental capacity, mental status such as sadness and depression, acceptance of limb function, and support of family members. According to Orem in the theory of nursing, self-care is an activity and initiative of the individual itself to meet and maintain their life, health and well-being (Koziar, 2008). While the Self Care Needs is an action that aimed at the provision and self-care that is universal and related to the process of human life as well as in the effort to maintain body functions. Universal Self Care is a daily activity (ADL) by grouping in basic human needs (Fiske et al., 2009; Koziar, 2008; Ottenbacher, 2008; Pelzang, 2010; Santrock, 2004).

**Social Support**

Social support is a function of the satisfaction of an interaction (i.e. social network) (Heaney & Israel, 2008; Papalia et al., 2007; Potter & Perry, 2009; Stanhope & Lancaster, 2004). Individuals or groups can be someone's support in dealing with health problems. According to Heaney and Israel, social support consists of (1) Emotional support includes empathy, love, trust, and caring; (2) Instrumental support includes perceived help and immediate service to help meet one's needs; (3) Information support includes advice, suggestions, and useful information to solve the problem of identity; and (4) Apterian support includes information useful for self-evaluation purposes (Heaney & Israel, 2008; Kirkwood & Cooper, 2014). Information support can be known how the process of thinking and behavior of the recipient after obtaining advice and advice. In the elderly who face various problems of life both from internal factors and external factors require social support. Based on the results of the study, the 110 elderlies have known about the assessment of social support to the elderly that is, most of the elderly get good emotional support amounting to 89.18%. Most of the elderly get good instrumental support of 79.9%. And most of elderly get good informational support also some 89.18%. Based on the results above can be expressed through social (networks and social support will have a positive effect on physical, mental, and social health. This opinion is in accordance with the statement (Heaney & Israel, 2008; Ma’rifatul, 2011; Ottenbacher, 2008), which stated that the physical condition of the elderly has increased physical well-being higher than the elderly group who do not get social support. The influence of social support has a
big impact on the interaction of individuals and social interactions, which are related to the events that affect the support is a conflict, a low relationship in society. Those conditions disrupted the process of functioning of social life (Heaney & Israel, 2008).

**Relationship of Social support with Physical well-being in Holistic care model.**

Based on the results of research indicates that social support has a coefficient of influence of 0.312; t statistics 4.420 and Characteristics of the elderly have a coefficient of influence 0.178; t statistics 1.65 states that the two factors that contribute to the model of holistic care of the elderly. the elderly who have good physical wellbeing are elderly who have a good degree of independence those are 44.5%, have a mild combat disease 41.8% and even states do not have 20% disease, and have no interference with 94% cognitive function. Based on the results of research about 80-89% of elderly states that physical health is maintained because of the efforts to maintain physical health, while physical health efforts obtained in the neighborhood around the community is an integrated service post elderly and elderly groups that provide facilities elderly gymnastics and physical examination.

The elderly health services available in the elderly environment have the positive impact in the fulfillment of physical health of the elderly (Keyes, 1998). In Indonesia, the physical wellbeing is problem that occurs in old age some people want to avoid the problem because of the discomfort felt at this age (Erfandi, 2014; Santrock, 2004). The elderly with all the fiscal deficits requires the attention of the family and its surroundings. Physical well-being in the elderly is not only the responsibility of the elderly but also the responsibility of the community and of course the government with the various policies.

The available social support provides support and positive impact on the physical well-being of the elderly. Emotional Support, it is appropriate that families provide the best in the elderly. In addition to maintaining warm relationships, maintaining contact, communication in daily activities, involving elderly in all family activities, not alienating elderly from the environment is positive support in the welfare of the elderly. The elderly requires socialization, sharing of feelings, experiences with peers. Based on the results of this study some elderly states that the family and the environment he needed in his old age.

Instrumental support has positive impact on the physical well-being of the elderly. Facilities related to the achievement of the elderly's physical well-being include the fulfillment of the daily physiological needs of the elderly (food, beverages, clothing and shelter) is the main thing in achieving this wellbeing. The need for healthy nutrition that contains a healthy diet as a preventive measure in order to avoid chronic disease requires special attention. Elderly not only need nutritional needs but also should meet the criteria of nutritional adequacy. The physical comfort of clothing and shelter is closely related to this achievement (Ma’rifatul, 2011).

Information support, In Indonesia there is a basic health service called Public Health Centers, in the implementation of elderly health fulfillment in groups is formed Integrated Service Post Elderly (Heaney & Israel, 2008; Setiahardja, 2005). The presence of integrated service post for elderly in addition to providing basic services also become a place for the elderly to communicate and interact with peers. In an integrated service interaction, the elderly allows an exchange of experience between older elderly and younger elderly.

The experience is certainly positive and provides learning for younger elderly can be more promotive and preventive functions. The elderly integrated service post can be an information support in this case. The exchange of knowledge and experience of the elderly occurred in this activity. In addition, in the integrated service post, the elderly receives information from the local health officials about their health condition and prevention so that there is no worsening condition.
CONCLUSION

In the holistic care model, the social support component is closely related to the achievement of Elderly physical well-being. Most of the elderly have good degree of independence. Most elderly people have mild physical complaints. Most elderly people do not have mild cognitive impairment. And they suffer from chronic illness. The social support includes, information Support, instrumental support and emotional support. In this study, it is explained that most elderly people at age 65-69, some elderly have high education, and most importantly some elderly have income with expenditure 0-40% of income so that can be stated elderly have ability in management of daily requirement. Physical wellbeing of the elderly is inseparable from the fulfillment of financial needs to fulfill it. So, to make a prosperous elderly period requires good financial planning. The hope nowadays the elderly should do the planning of activities related to financial.

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GOD SERVANTS’ KNOWLEDGE AND STIGMA OF TUBERCULOSIS IN KUPANG INDONESIA

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ABSTRACT

Background: Knowledge and stigma are the factors that determine the success of TB control. The people of East Nusa Tenggara still rely heavily on the support of God's servants in addressing health issues. God's servant is someone who is believed to have the gift of healing through prayer to the Lord Jesus.

Aim: This study aimed to reveal God’s servants’ knowledge on and stigma to TB.

Methods: This study is a descriptive quantitative study, in which the research aims to perceive God’s servants’ knowledge and stigma to TB in 2 community health centers with the most TB cases in Kupang. The population of the study was God’s servants in three areas of coverage of community health centers with the most TB cases. The sample of the study was the entire population (Total sampling) as many as 120 people. Data were collected through questionnaires and using mid-point score.

Results: The results showed that the knowledge related to transmission, treatment, and prevention of Tuberculosis was low, amounted to 76%, similar to the stigma to TB that was amounted to 58%. God's servants still held the stigma that TB is a curse and disgraceful disease and they were unwilling to share with tuberculosis patients.

Conclusion: God’s servants’ knowledge related to TB is low. As for stigma, even though mostly is low, there are still many God’s servants who give stigma to TB disease. Since God’s servant is a potential figure believed by some people to have the gift of healing, their knowledge and stigma needs to be improved in order to provide true information and support for TB patients.

Keywords: knowledge, stigma, God’s servant, tuberculosis

INTRODUCTION

Indonesia is ranked the second country with the most TB cases in the world. In 2015, it was reported that the number of TB cases reached 330,910 cases and was estimated to increase to 460,000 by 2017 (WHO, 2016). Likewise in East Nusa Tenggara, there was an increase in TB cases by 6,354 in 2016 compared to 4,485 cases in 2015. In 2015, new TB cases were found in 10 per 100,000 populations. However, in 2016, the number increased to 15 per 100,000 populations. One of the indicators to measure the success of the pulmonary tuberculosis program is cure rate with annual target of 90%. In 2015, the cure rate was 66.30% and in 2016 the number decreased to 52.81%. It shows that in 2016, there was a
decrease in the number of patients with BTA+ pulmonary TB who had been recovered, and every year until now, the cure rate has never reached the target of the strategic plan. Similarly, the success rate only reached 87.9%, whereas the national target is 100%. The highest cure rate is in Central Sumba Regency (97.30%), followed by Sabu Raiju Regency (88.57%), while the lowest is in Kupang (28%). The highest success rate is in Malaka regency with 100%, followed by TTU regency with 72.99%, while the lowest is in Kupang with 71.93% (DinKes Propinsi NTT, 2016).

The failure of TB control is due to the embarrassment and lack of family and community support (Finlay et al., 2012). Stigma is also a factor often experienced by TB patients where they will be excommunicated because the disease can spread to others (Diefenbach-Elstob et al., 2017). Local support is the potential and resources possessed by an area to be used to achieve goal (Davtyan et al., 2015). God's servant is an informal leadership figure that lives and develops among the East Nusa Tenggara community. God's servants become a potential figure in East Nusa Tenggara as they contribute to the solving of health issues in the community (Manurung, U.W, & Probandari, 2016).

Most of the East Nusa Tenggara population is very dependent on God’s servants other than the health workers because God’s servants’ ideas, words and behavior are role models. God's servant is a person who is believed to have the gift of healing and be able to help individuals overcome the struggles of life. Some of East Nusa Tenggara population, especially those in remote areas, sees TB as a disease due to mystical things. To seek for cure, people commonly see God’s servant in order to be prayed for. They will do anything the God’s servant tells them to. Research conducted by (Manurung et al., 2016) shows that God’s servant’s health literacy and perception have a great influence on the social support they provide to individuals at risk for HIV and AIDS to do VCT. This research is important in revealing God’s servants’ knowledge on and stigma to Tuberculosis because people in East Nusa Tenggara seek for cure to God’s servants.

METHODS

Study design
This research is descriptive quantitative study. The study population was all God’s servants in the area of three community health centers with the most TB cases in Kupang i.e. Sikumana, Bakunase and Oesapa. God's servant is someone who is believed by community to have the gift of healing illness and may be any religion. Information about how many God’s servants in the study site were obtained from community.

Sample
The total population of God’s servants was 120 people. The inclusion criteria of the sample were God’s servants who actively serve sick people at least 10 people in one month. The number of samples being the respondents of the study was the entire population (total sampling).

Instrument
The instrument used questionnaire in this study was the modified instruments used by Jittimanee et. al (Jittimanee et al., 2009) to measure stigma to patients with tuberculosis in Thailand. Data were collected through interview. Stigma and knowledge variables use different questionnaires. Questionnaire containing knowledge about TB, risk factors for transmission and prevention. The stigma questionnaire was asked first before the knowledge. Each questionnaire is asked to the respondent and written by the researcher. The knowledge variable consisted of 7 items of questions related to the definition, symptoms, transmission, prevention and treatment of TB. A value of 1 was given when the answer was correct and the value of 0 was given when the answer was wrong. The stigma variable was a statement with 2 choices, the value of 0 was given when the respondent chose agree and the value of 1 was given when the
respondent chose disagree. The score range of this instrument ranges from 0-7. The measurements of this instrument are high and low knowledge and high and low stigma. The analysis technique used the mid-point of the total score of the instrument; the maximum value was reduced by the minimum value and then divided by two. The mid point score in this study was 3.5. Therefore, the knowledge as well as the stigma was considered to be low when the score was lower than 3.5.

**Data analysis**

A percentage statistical analysis was used to obtain a description of the frequency distribution of the variables studied.

**Ethical consideration**

Ethical clearance was obtained from the Faculty of Medicine Nusa Cendana University, Indonesia. A written informed consent was received from all God’s servants. The researcher maintained the confidentiality of respondents’ identity, other identifying information.

**RESULTS**

Based on the results of the study, Table 1 shows that the most characteristics of the respondents were housewife, Christian, and having been God’s servant for more than 5 years.

| Characteristics                          | Frequency |
|------------------------------------------|-----------|
| Respondents                              |           |
| Gender, % male                           | 58        |
| Religion, % Christian                    | 85        |
| Age, % <40 years                         | 38        |
| Occupation, % employee                   | 59        |
| Education, % bachelor or higher          | 71        |
| Period of service as a God’s servant; %> = 5 years | 92        |
| Knowledge on TB (Respondent with correct answer; n = 120) |           |
| TB is a disease caused by witchcraft     | 50        |
| A person with TB can be cured            | 89        |
| Coughing for more than 2 weeks is one of the symptoms of TB | 45        |
| TB may lead to death if patient fails to take medication regularly | 42        |
| TB can be transmitted through cutlery    | 32        |
| TB transmission can be prevented if TB patients do not cough up sputum carelessly. | 38        |
| TB patients may stop taking the medication when they are getting better | 50        |
| Stigma (number of respondents withsStigma; n = 120) |           |
| TB is a curse                            | 86        |
| If one of my family members suffers from TB, I do not mind sharing my cutlery with him/her | 83        |
| I am ashamed if one of my family members suffers from TB | 89        |
| I do not want to share a bed with a person taking TB treatment | 87        |
| TB is the illness of the poor            | 65        |
| People with TB should be isolated        | 83        |
| TB sufferers are a disgrace to the society | 84        |
| Category                                 |           |
| Knowledge on TB (Good)                   | 42        |
| Stigma (High)                            | 82        |

The results showed that the most respondents had their answer wrong to the statement that TB can be transmitted through sharing cutlery (73.3%). On the other hand, most of the respondents had their answer correct to the statement that TB can be cured (74.2%). The most stigma was given to the statement ‘I am ashamed if one of my family members suffers from TB’. The least stigma was given to the statement ‘TB is the illness of the poor’. Based on the category of mid-point value, it was obtained that as many as 78 God’s servants (65%) had lower knowledge on TB. As for the stigma, 82 God’s servants (68%) were categorized as having high stigma.
DISCUSSION

The knowledge of God's servants is still poor due to the lack of access to information about TB (Dewi, Barclay, Passey, & Wilson, 2016). Several factors that affect the poor knowledge can be caused by the lack of socialization of TB and the limited media of TB related information in reaching various communities in society, especially the community of God’s servants (Tadesse, 2016). This community is influential for people who need prayer service because it is believed to have the gift of curing illness through the power of prayer (Paul et al., 2015). There are many people in NTT who still use God's servant's prayer to support healing.

God’s servant is very trusted and able to influence his patients to stay strong (Stewart, 2014). People who use prayer service from God’s servant will honestly answer every question and will follow the advice proposed by the God’s servant. Health education for God’s servants, particularly on TB, is very important because the aim of the prayer service given is to cure illness (Craig, Daftary, Engel, O'Driscoll, & Ioannaki, 2017). God’s servant with poor knowledge will influence the intervention provided for individuals who are suspected to have and infected with TB. According to God’s servants’ confession, they once gave advice for people infected with TB to stop taking medicine because they believed that the illness had healed through prayer. God’s servants who have a thorough knowledge on TB treatment will certainly motivate TB patients to regularly take medicine (Eriksson, Lindmark, Haddad, & Axemo, 2014). God’s servants who have a proper knowledge on TB will be a supporting factor for the recovery of TB patients. On the other hand, God's servants who have poor knowledge on TB can be an inhibiting factor in the recovery process of TB patients (Williams, Glanz, Kegler, & Davis, 2012).

The results showed that there were still many God’s servants who had TB related stigma. Stigma is one of the social determinants that can cause health issues too late to be addressed (Diefenbach-Elstob et al., 2017). God’s servants who had a stigma to TB once advised a family to isolate TB patients. Yet, the God’s servants were still willing to provide prayer service to TB patients. The concept of their service is the service of love. Although they have a stigma to TB patients, they are still willing to serve them (Williams et al., 2012). The service given by God’s servants will definitely support the service given by Community Health Centre if God’s servants have a proper knowledge and do not give stigma.

CONCLUSION

God’s servant as a figure of local wisdom potential for addressing health issues can support TB control if they are well informed and do not give stigma. Therefore, efforts to improve their knowledge through various communication media are necessary.

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Original Research

THE EFFECT OF CLIMATE FACTORS FOR DENGUE HEMORRHAGIC FEVER IN BANJARMASIN CITY, SOUTH KALIMANTAN PROVINCE, INDONESIA, 2012-2016

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ABSTRACT

Background: One of the factors that lead to high incidence of DHF is climate change.
Objective: To analyze the effect of climate factors (temperature, humidity, wind speed, and rainfall) associated with DHF incidence in Banjarmasin City, 2012-2016.
Methods: We used the national data on annual reported incidence from Health Office of Banjarmasin City and climate variations from Meteorology Climatology and Geophysics Agency 2nd Class Climatology Station Syamsudin Noor Banjarmasin, January 2012-December 2016. The analysis techniques using path analysis to explained the mechanism of causal relationships between variables.
Results: The result showed the overall incidence of DHF in Banjarmasin City during 2012-2016 was 243 cases, of DHF cases were fluctuates by the monthly trend, where the highest number of DHF cases in January to March, climate variation which occurred in Banjarmasin City period 2012-2016 included temperatures ranged from 25.8-28.7°C, humidity ranged from 65-88%, wind speed ranged from 4-6 knots and rainfall ranged from 0.0-546.7 mm, and the path analysis showed that rainfall variable (X4) was the only variable which positively effected to DHF incidence variable (Y) equal to 0.613 unit (Y = 0.613 X4) (p value = 0.002).
Conclusion: Climate information can used as a precautionary signal through early warming of the readiness in facing the outbreaks of vector borne diseases so that further efforts in environmental management by manipulation method and environmental modification.

Keywords: dengue hemorrhagic fever, climate factors, aedes aegypti

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a public health problem of the world, especially in developing countries (Perwitasari & Ariati, 2015; Setiawan, Supardi, & Bani, 2017) and the one of the infectious diseases on deathly effect (Mangguang & Sari, 2017; Sihombing, Nugraheni, & Sudarsono, 2018). DHF is an infectious disease caused by four serotypes of Dengue virus (DEN 1, 2, 3, 4) transmitted through the bite of Aedes aegypti mosquitoes (Sihombing et al., 2018; Tosepu, 2017), an endemic in tropics and sub tropics in various parts of the world especially in the rainy season (Handoyo, Hestingsih, & Martini, 2017; Johansson, Dominici, & Glass, 2009; Sumi et al., 2017). Recently, WHO estimates
that there were 50 to 100 million people dengue infection with an average 2.5% number of deaths each year and estimated more than 70% of The Southeast Asian and Western Pacific regions were the most seriously area affected by DHF (WHO, 2011).

Indonesia, one of the countries in Southeast Asia, has a large burden of dengue fever infections. One of the provinces in Indonesia including in a DHF endemic region is South Kalimantan. Spreading of Dengue fever in this region occurs in 13 (thirteen) cities/districts. In 2016, total population was 4,055,479 people, dengue cases of Incidence Rate (IR), Case Fatality Rate (CFR), and number of deaths were 101.5/100,000 population, 0.68%, and 28 people, respectively (Riskesdas, 2016). The highest case occurred in Banjarmasin City (Marlinae, 2016). Reported data from the Health Office of Banjarmasin City showed that the incidence of DHF last four years was increase. In 2013, there were 33 cases and 1 death, in 2014 than decreased to 11 cases, and contrarily in 2015-2016 were increase more than six times to 75 cases (5 deaths) and 57 cases and (a death) (DinKes, 2016).

One of the factors that lead to high incidence of DHF is climate change (Baylis, 2017; Butterworth, Morin, & Comrie, 2016; Lasut, Kaunang, & Kalesaran, 2017; Yushananta & Ahyanti, 2016). Transmission of some infectious diseases is strongly influenced by climate especially temperature, humidity, and wind speed (Brisbois & Ali, 2010). Dengue fever transmission very sensitive to climate, causing bionomic changes such as environments being warm and suitable temperatures enhance the biting behavior of adult mosquitoes, gonotrophic cycles, larval development rates, viral replication speeds, and rainwater induced by rainfall are indispensable by DHF vectors to proliferate (Cheong, Burkart, Leitão, & Lakes, 2013; Mangguang & Sari, 2017). Rainfall affects density of adult female mosquitoes. High rainfall lead to establishment of a breeding ground for mosquitoes that can increase the mosquitoes population (Promprou, Jaroensutasinee, & Jaroensutasinee, 2005). Thus, vector borne disease such as Dengue Hemorrhagic Fever (DHF) needs to be watched as transmission of this disease will increase with climate change and it can be said that global warming is predicted by 2100, with a temperature rise of 2.0°C-4.5°C will have a major impact on the disease caused by vector (WHO, 2011).

Banjarmasin City condition which is always increasing the number of cases of dengue fever every year and less of study on climate effect (temperature, humidity, wind speed, and rainfall) in Banjarmasin urban area encourage more specific research related to climate effect to DHF incidence. So the results of this study can be used as a reference of important information as an effort to prevent the case of DHF through early warming.

METHODS

Study design

The type of this research was a quantitative descriptive with ecological time trend as a study research design to analyzed the magnitude of climate effect on the incidence of dengue disease in time period of 2012-2016 in Banjarmasin City.

Location and time research

This research was conducted in Banjarmasin City, which started in September until December 2017.

Research subject

In this research used population where the data used was aggregate data of DHF incidence in Banjarmasin City, period 2012-2016.

Instrument

The cases of DHF was a patient who exposed to Dengue Hemorrhagic Fever with Incidence Rate per 100,000 inhabitants (Dinas Kesehatan Kota Banjarmasin, 2016) and climate factors include temperature, average per month in °C optimum 25°C-27°C, humidity, average per month in % steam, optimum < 60%, wind speed, average per month in knots and rainfall, average per month in mm (Badan Meteorologi...
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**Data collection**
This research was document observation used secondary data obtained from the Health Office of Banjarmasin City and Meteorology Climatology and Geophysics Agency 2nd Class Climatology Station Syamsudin Noor Banjarmasin.

**Ethical considerations**
The ethical approval was obtained from the Health Office of Banjarmasin City and Meteorology Climatology and Geophysics Agency 2nd Class Climatology Station Syamsudin Noor Banjarmasin.

**Data analysis**
Mechanism of causal relation between temperature, humidity, wind speed, and rainfall on the incidence of DHF disease were analyzed using path analysis. Correlations between variables were associated with model parameters expressed by path diagrams.

**RESULTS**
Figure 1 shows that data of DHF incidence in Banjarmasin City during the period of 2012-2016 was 243 cases. The lowest cases found in 2014 while the highest found in 2015 by 11 cases and 75 cases (5 deaths) respectively.

Figure 2 shows that monthly trend over a five years (2012-2016), the number of dengue fever cases began to increase in January, February and March, than decreased in April. The lowest cases occurred in September, and cases of DHF incidence began to increase again from October to December.
Effects of climate factors (temperature, humidity, wind speed, and rainfall) in Banjarmasin City, 2012-2016

Figure 3 shows that climate variations of Banjarmasin City during the period of 2012-2016 such as the temperature ranged from 25.8-28.7°C with the lowest and highest temperatures being in 2012 and 2015 respectively. The humidity ranged from 65-88% with the lowest and highest humidity is in 2015 and 2013, 2015 respectively. The wind speed ranged from 4-6 knots. This condition tends stable over a 5-year period. And, the rainfall ranged from 0.0-546.7 mm with the lowest and the highest rainfall occurs in 2015. Effects of climate factors (temperature, humidity, wind speed, and rainfall) variables on the incidence of DHF can be illustrated in the following path analysis diagram.
Figure 4 shows that relationship path between variables through direct and indirect effects. Direct rainfall positively affects the incidence of DHF. The direct quantity of rainfall on the occurrence of DHF is 0.613 (61.3%) (p value = 0.002) means that the high incidence of DHF is influenced by rainfall of 61.3% while the remaining 38.7% is influenced by other factors outside the model.

The indirect effect of $X_1$ to $Y$ through $X_4 = 0.111 \times 0.613 = 0.068$, with total effect $= -0.202 + 0.068 = -0.134$. The indirect effect of $X_2$ to $Y$ through $X_4 = 0.845 \times 0.613 = 0.517$, with a total effect $= -0.548 + 0.517 = -0.031$. And, the indirect effect of $X_3$ to $Y$ through $X_4 = 0.050 \times 0.613 = 0.030$ with the total effect $= -0.121 + 0.030 = -0.091$.

**DISCUSSION**

DHF incidence in a region is influenced by many factors, whether it comes from demographic aspects (population density, mobility, behavior, social economy), vectors (type and density), host (vulnerability and immunity), as well as environmental aspects including weather or climate (Ariati & Anwar, 2014). In this study the incidence of DHF is only seen from one of the factors, namely climate factors include temperature, humidity, wind speed, and rainfall. The results show that monthly trend analyze over the five-year period (2012-2016), the incidence of DHF in Banjarmasin City is fluctuates, where the number of dengue cases began to increase in January, February and March, than decreased in April. The lowest number of cases occurred in September, and cases of DHF began to increase again from October to December. These results are in line with the rainy season that occurred in the Banjarmasin City, which began in early October to March. Study states that the season of transmission of dengue fever generally occur at the beginning of the rainy season, at the beginning of the year and the end of the year (Lasut et al., 2017).

Dengue epidemics in most countries reported occur during the wet, humid and warm seasons that support mosquito growth and shorten the extrinsic incubation period (Iriani, 2016). Temperature has a direct relationship with vector metabolism. The optimum average temperature for development of mosquitoes is 25°C-27°C (Wulandari, Fitriany, & Dini, 2010). The temperature level in Banjarmasin City 2012-2016 ranges from 25.8-28.7°C, an optimum temperature for mosquitoes development. The speed of a mosquitoes development depends on the speed of its metabolism which is partially regulated by the temperature so that certain biological events such as the length of pre-adulthood, the digestive velocity of the sucked blood
and maturation of the ovaries and the frequency of taking food or biting differ by temperature, as well as duration of viral travel in the body mosquito. Mosquitoes can survive at low temperatures, but their metabolism decreases or even stops when the temperature falls below the critical temperature. The growth of the mosquito will stop completely if the temperature is less than 10°C or more than 40°C (Ariati & Anwar, 2014).

Humidity conditions in Banjarmasin City 2012-2016 ranged between 65-88%. This condition is the comfort zone for mosquitoes to breed and humid conditions can also affect the mosquitoes age flying distance, and biting habits (Paramita & Mukono, 2018). At relatively high humidity will cause mosquitoes to being endophilic and have more resting properties in the home or settlements that have the appropriate humidity (Arsin, 2013). At less than 60% humidity, the mosquito’s life becomes short, so it is insufficient for the virDen breeding cycle in the mosquito body.

Wind speed at sunrise and sunset where mosquitoes fly in or out of the house determines of human contact with mosquitoes. Wind speeds ranging from 11-14 m/sec influence or inhibit mosquito flight. Wind speed will affect the flight distance of mosquitoes (Lasut et al., 2017). Wind speed conditions in Banjarmasin City 2012-2016 ranged between 4-6 knots. This speed is a velocity that will not inhibit mosquito vectors to fly, so it can be said ideal for mosquito vectors.

Rainfall contributes to availability of Aedes aegypti vector habitat. Rainfall will increase the puddle of water as a breeding ground for mosquitoes. Rainfall conditions in Banjarmasin City 2012-2016 ranged from 0.0-546.7 mm. High rainfall can cause puddles in water reservoirs around the house or other areas where larval breeding becomes mosquitoes. The effects of rainfall on vectors vary, depending on the amount of rainfall, the frequency of rainy days, the geography and the physical nature of the land or habitat type as the reservoir of water that is the mosquito breeding place (Arsin, 2013). Rainfall is one of the meteorological variables that can be used as early warming control mosquito.

Path analysis in this study was conducted to explain the mechanism of causal relationship between temperature ($X_1$), humidity ($X_2$), wind speed ($X_3$), and rainfall ($X_4$) on DHF incidence ($Y$). Figure 4 shows the path coefficient of temperature, humidity, wind speed, and rainfall on the DHF incidence in Banjarmasin City. The result of path analysis shows that rainfall variable is the only positively effect on the DHF incidence ($Y$). Where it can be interpreted that any increase of 1 unit of rainfall variables will increase incidence of dengue disease by 0.613 units ($Y = 0.613 X_4$) (p value = 0.002). This result is in line with the research conducted in Pringsewu, Lampung (Yushananta & Ahyanti, 2016), Palembang (Iriani, 2016), and Malaysia (Cheong et al., 2013) which states that rainfall directly affects the DHF incidence and there is a correlation between rainfall and the increase of dengue fever treated in the hospital. However, the results of this study are not in line with the research conducted in Serang, Banten (Wulandari et al., 2010) that there is no significant relationship between climate temperature factor, rainfall, rainy day, solar irradiance, humidity and wind speed with the DHF incidence due to lack of duration of data taken, incomplete climatic data obtained, and lack of frequency of dengue incident data taken.

Entomological status of high dengue vectors such as larvae free (ABJ) is supported by high rainfall and may encourage an occurrence of DHF and rain variability have direct consequences on outbreaks of infectious diseases (Widiarti, 2013). The Aedes mosquito itself requires an average rainfall of about 350 mm to over 500 mm per year for successful breeding (Chen et al., 2012; Jacob, Pijoh, & Wahongan, 2014).

The efforts to reduce incidence of dengue disease are by controlling the number of
density of Aedes aegypti larvae with Free Rate Indicator of larvae (ABJ). While rainfall and other climatic factors are variables that can not be controlled. Climate information can be used as a precautionary signal through early vigilance related to the readiness to face outbreaks of vector-borne diseases and rainy season associated with increasing cases of DHF events, so that the efforts can be made environmental management by the manipulation method and environmental modification. To the necessary participation of all communities, in this case focuses on the role of households to be able to manage their environment by always maintaining the cleanliness of the surrounding environment.

CONCLUSION

Distribution of DHF incidence in Banjarmasin City in term of fluctuating monthly trend, where the highest number of dengue cases in January to March, climate variations that occurred in Banjarmasin City was an ideal condition for DHF vectors proliferation that potentially increase the spread of DHF incidence. The result of path analysis shows that rainfall variable is the only variable that has positive effect on the variable of DHF incidence. Early vigilance activities that can be done is cooperation among relevant agencies include proactive coordination in tackling DHF cases so that the spread of DHF is not widespread and does not occur DHF outbreaks, dissemination of measurement results based on the month of each year related to climate variations that occur, so to make efforts to prevent such as field surveys, abatesasi, fogging and regular larva monitoring (PJB) and Mosquito Nest Eradication (PSN) 3M Plus in the community.

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THE BEHAVIOR OF FOOT CARE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: APPLYING THE THEORY OF PLANNED BEHAVIOUR

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ABSTRACT
Background: Diabetes mellitus (DM) is a chronic non-infectious disease with complications such as diabetic foot, which has the potential for amputation if left untreated. Theory of Planned Behavior (TPB) is a behavior-based theory that can be applied to DM patients including foot care to minimize risk. Some studies related to TPB particularly about physical activity and diet have been explored, however, studies on foot care are still lacking.
Objective: This study aims to apply the Theory of Planned Behavior (Intentions, Attitudes, Subjective Norms and Behavioral Control) on the patient's foot care.
Methods: This was a cross sectional descriptive study. There were 93 patients diagnosed with type 2 DM recruited at 9 public health centers (Puskesmas) using accidental sampling on April 2018. TPB-based foot care questionnaire from the IWGDF (International Working Group on Diabetic Foot) Diabetic Foot guidelines was used. Data were analyzed in the form of frequency distribution.
Results: Of the total number of respondents, 25 males and 68 females with average age of 53.05 ± 8.04 years, approximately 87.1% of them have the intention to wear footwear according to size. The majority of patients think that washing feet every day is a form of good and positive practice. They also agree that the family expects the patient to examine the presence of bone / joint protrusions independently and believes that monitoring the foot deformities performed by other DM patients is very important as well as having control that the patient can check for signs of boils in the legs and there is a high likelihood of blisters / sores if the socks used are not suitable.
Conclusion: The majority of respondents have good intentions, positive attitudes, social support and behavioral controls for foot care.
Keywords: diabetes mellitus, diabetic foot care, theory of planned behaviour

BACKGROUND
Diabetes mellitus (DM) is a progressive chronic disease that is caused by a lack of production of insulin derived or acquired by the pancreas. In other words, the insulin produced is not effective, which affects the body's metabolism of carbohydrates, fats and proteins which can cause blood glucose levels to rise (Black & Hawks, 2014). While Type 2 or NIDDM (Non-Insuline-Dependent Diabetes Mellitus) Diabetes Mellitus is a condition where the body becomes resistant to the normal effects of insulin caused by genetic and environmental factors (Thomassian, 2017). Some of the results of research into gene
factors and the environment are very instrumental in the development of type 2 DM disease (Brunetti, Chieffari, & Foti, 2014; Ekpenyong, Akpan, Ibu, & Nyebuk, 2012).

Globally, in 2014, people suffering from DM was around 422 million and in 2015 around 1.6 million died (Organization, 2016). Based on data from the International Diabetes Federation in 2015, diabetes mellitus patients in Indonesia as many as 10 million people are currently the third leading cause of death (6.7%) after stroke and heart disease (Kementerian Kesehatan, 2014). In Southeast Sulawesi, diabetics diagnosed by doctors and other health workers, including based on symptoms, are recorded at around 3% (780 people) (Indonesia, 2013).

Diabetes is classified as a lifelong disease with complications in the form of diabetic foot symptoms characterized by neuropathy, ischemia and infection (Pendsey, 2010) Complications such as neuropathy, Indonesia occupy the highest position (54%) (Aumiller & Dollahite, 2015), an estimated 15% of DM patients have diabetic foot complications. Diabetic foot is a form of macrovascular complications that is very dangerous if left untreated maybe because of the potential for loss of limbs or amputation (Shearman, 2015) that diabetics cause 1.5 million who die with complications of lower limb amputation in 2012. The possibility for amputation complications can occur which begins with the emergence of diabetic foot injuries with infection (Wukich, Sadoskas, Vaudreuil, & Fourman, 2017). A study of 249 people with type 2 diabetes mellitus with a risk factor for wounds was around 55.4% and for diabetic foot injuries around 12%, of which the predictors were daily foot examinations, including age, insulin, shoes and belief (Yusuf et al., 2016). Therefore, routine foot care through foot examination is one of the main early interventions for health care services that can be performed on diabetes patients to minimize the risk of diabetic foot injury (Al-Rubeaan et al., 2015; Goie & Naidoo, 2016; Tiwari et al., 2012).

The results of interviews with diabetic foot care from several patients diagnosed with type 2 DM in several health centers in Kendari City revealed that most of the DM patients have not been fully exposed to diabetic foot care, so they always ignore and they assume that foot care is only done when there is an injury. So the fact is that all this time they always ignore the importance of diabetic foot care. This is due to the lack of knowledge / information about diabetic foot care. All this time what they always do to minimize the risk of complications is just diet, exercise every week done in each public health center (Puskesmas) through prolans government program and monitoring of blood sugar levels every month by the health team from Prodia laboratory.

Early intervention through the participation of diabetic patients in health care services including behavioral changes related to foot care is very useful to minimize the risk of diabetic foot injury that points to amputation if not treated as early as possible (Glanz, Rimer, & Viswanath, 2008). That behavior change begins with a person's intention to change. Intention to change is predicted by several variables: attitude, subjective norms and behavioral control. The basis of the theory of change is the concept of the Theory of Planned Behavior (TPB) which is one of the behavioral-based nursing theories. This theory states that achieving changes in one's behavior depends on intention and ability (LaMorte, 2016). The studies in DM patients with the application of TPB include physical activity and diet that has been widely used (Boudreau & Godin, 2014; Rahmati-Najarkolaei et al., 2017), however, the study of foot treatments in DM patients from TPB is still lacking, therefore this study aims to apply TPB-based foot care in type 2 DM patients.

METHODS

Study design

This research is a descriptive study with a cross sectional approach. This approach is carried out by collecting data directly at one time in order to provide an overview of the
characteristics of a population sample (Grove, Burns, & Gray, 2014; Neuman, 2013).

**Setting & Sample**

This study was conducted from April to May 2018 on 93 patients diagnosed with type 2 DM who were recruited at 9 public health centers (Puskesmas) throughout Kendari city, namely Puskesmas Nambo, Abeli, Poasia, Mokoau, Jati Raya, Lepo-Lepo, Wua-Wua, Mekar and Puskesmas Puuwatu. The recruitment of samples was conducted during prolanis activities at each puskesmas through non-random sampling method with accidental sampling, which the researchers took samples at the time of the study. Some of the inclusion criteria of this sample were patients aged ≥20 years, diagnosed with type 2 diabetes mellitus with FPG 61-26 mg / dL or 2-h PG ≥200 mg / dL (based on medical records of puskesmas), no injuries on the feet, willing to participate in research and be able to read and write.

**Instrument**

The research instrument used was a questionnaire about TPB-based foot care that was prepared based on the guidelines for making TPB-based instruments and foot care, which refers to the IWGDF (International Working Group on Diabetic Foot) Diabetic Foot guidelines which can support the prevention of foot problems (Bakker, Apelqvist, Schaper, & Board, 2012; Francis et al., 2004; Schaper et al., 2016). The instruments that the researchers have compiled based on these guidelines were then validated by 4 experts in the field of diabetic foot injuries with criteria for ETN (Enterostoma Therapy Nurse) and experienced in the clinic with I-CVI (Item Content Validity Index) results of each item is 0.75 and 1.0. However, prior to CVI, a pilot study was first conducted to ascertain whether there were sentences in the instrument that were not understood by participants, including the time needed to fill the questionnaire. The validated research instrument consists of 40 statement items measured using a likert scale with answer choices from the range 1 s.d 7 and (-3) s.d (+3). The answers with the highest scores are values 6 and 7 or positive values of +2 and +3, showing answers that are sufficiently varied from the opinions agree-strongly agree, useful-very useful, desirable-very desirable, maybe-very possible, should-very ought to be, important - very important, easy - easier or harder - more difficult, permissible - very permissible to do, fun - very pleasant, things that are really right to do, good practice - very good practice. Of the 40 statement items consisting of 6 statements representing Intent and 34 statement variables representing predictor variables (4 statements representing Direct Attitude, 8 statements representing Indirect Attitudes, 3 statements representing variables of Direct Subjective Norms, 8 statements representing variable Indirect Subjective Norms, 3 statements representing the Direct Behavior Control variable, 8 statements representing Indirect Behavior Control variables.

**Data collection and analysis methods**

The researcher collected data directly from each respondent through introduction stages with the explanation of the objectives, the signing of the informed consent, and the fulfillment of the questionnaire. The data that has been collected both the characteristics of the respondents and the description of the research variables, including variables from the Theory of Planned Behavior consisting of intention and predictor variables attitudes, subjective norms and behavioral controls, were then analyzed and described in the form of frequency distribution.

**Ethical consideration**

This study has received approval from the Health Research Ethics Committee of Faculty of Medicine, Hasanuddin University with No. 184 / H4.8.4.5.31 / PP36-KOMETIK / 2018. Signs of verbal consent were also obtained from respondents who participated in the study.

**RESULTS**

In Table 1 the average demographic of respondents based on age was 53.05 ± 8.047 years, sex was dominated by women (68
people, 73.1%), more education at the university level (PT) (34 people, 36.6%), work as a housewife is more (39 people, 41.9%), marital status is dominated by respondents with marital status (80 people, 86.0%), long time to suffer from DM who is <5 years more (59 people, 63.4%), average blood glucose level (273.96 ± 99.127 mg/dL).

Table 1 Distribution of frequency based on the characteristics of respondents (n=93)

| Variable                          | Total | f (%)       | Mean ± SD     |
|-----------------------------------|-------|-------------|---------------|
| Age (year)                        |       |             |               |
| Early & late adults (26-45)       | 14    | (15.1)      | 53.05 ± 8.047 |
| Early age (46-55)                 | 41    | (44.1)      |               |
| Late age (>56)                    | 38    | (40.9)      |               |
| Gender                            |       |             |               |
| Man                               | 25    | (26.9)      |               |
| Women                             | 68    | (73.1)      |               |
| Education                         |       |             |               |
| Primary school                    | 15    | (16.1)      |               |
| Junior high school                | 14    | (15.1)      |               |
| Senior high school                | 30    | (32.3)      |               |
| College                           | 34    | (36.6)      |               |
| Employees                         |       |             |               |
| Government                        | 37    | (39.8)      |               |
| Military                          | 1     | (1.1)       |               |
| Farmer                            | 2     | (2.2)       |               |
| Entrepreneur                      | 14    | (15.1)      |               |
| Housewife                         | 39    | (41.9)      |               |
| Status of marriage                |       |             |               |
| Married                           | 80    | (86.0)      |               |
| Not married                       | 1     | (1.1)       |               |
| Widower                           | 1     | (1.1)       |               |
| Widow                             | 11    | (11.8)      |               |
| Long suffering of Diabetes Mellitus (years) | |  | | |
| < 5                               | 59    | (63.4)      |               |
| ≥ 5                               | 34    | (36.6)      |               |
| Blood of sugar levels (mg/dL)     |       |             |               |
| FPG (Fasting Plasma Glucose)      | 21    | (22.6)      | 273.96 ± 99.127 |
| 2-h PG (2-Hour Plasma Glucose)    | 72    | (77.4)      |               |

Table 2 Percentage of participants who have a high intention for foot care (n=93)

| Item | Statement                                                                 | Answers (%) |
|------|---------------------------------------------------------------------------|-------------|
| 1    | I hope to wash my feet daily with warm water                             | 75.3        |
| 2    | At this time I intend to examine my feet every day for blisters or boils  | 73.1        |
| 3    | I really want to wear footwear (shoes / sandals) at any time both inside and outside the house | 76.4 |
| 4    | I hope to wear shoes / sandals that fit / match the size of my feet      | 87.1        |
| 5    | At this time I intend to cut my toenails straight                          | 76.3        |
| 6    | I would love to check for nail deformities on my toes                     | 76.3        |

Table 2 describes the frequency distribution of respondents' answers to intentions in performing foot care. Patients hope to wear shoes that are suitable for size with total answers of 6 and 7 showing a higher percentage (87.1%) including the desire of patients to wear footwear both inside and outside the house 76.4%.
Table 3 Percentage of participants who have a positive attitude and support for foot care (n=93)

| Item | Statement | Answers (%) |
|------|-----------|-------------|
| 1    | In my opinion, washing my feet every day with warm water is ... (very useless, very useful) | 92.5 |
| 2    | In my opinion, washing my feet every day with warm water is ... (very exciting s.d very unpleasant) | 88.2 |
| 3    | In my opinion, washing my feet every day with warm water is ... (the very wrong thing done is that things really are done) | 94.6 |
| 4    | In my opinion, washing my feet every day with warm water is ... (very good practice, very bad practice) | 96.7 |
| 5    | If I wash my feet every day with warm water, I will feel that I am doing something positive for myself | 86.1 |
| 6    | I feel worried if I experience tingling / pain in my legs | 80.7 |
| 7    | If I check my foot skin (color, edema, capallan, temperature), I can detect problems at an early stage | 73.1 |
| 8    | If there is a history of previous injuries, I have to see them often | 78.5 |
| 9    | Check my feet more often for abrasions, scratches or boils | 68.9 |
| 10   | I feel worried if there is a boil on my leg | 59.1 |
| 11   | Thinning the calluses on my feet by the nurse specialist wounded for me is ... | 62.3 |
| 12   | Detecting nail deformities on my toes in the early stages is ... | 61.3 |

Note: Items number of 1 to 4 include direct attitude while 5 to 12 includes indirect attitude, Number of 9 to 12 answer options -3 s.d +3

For Table 3 which describes the attitude in doing foot care shows that the highest frequency distribution of respondents is in the subvariable direct attitude that according to patients washing their feet every day with warm water is a form of good practice showing a total total score of 96.7%. As for the most indirect attitude in patients who think that washing feet with warm water means that they have done something positive about themselves with the highest percentage of total answers, namely 86.1%.

Table 4 Percentage of participants on subjective norms who have high social pressure on foot care (n=93)

| Item | Statement | Answers (%) |
|------|-----------|-------------|
| 1    | My family and friends think that I don't need to wash my feet every day with warm water | 82.8 |
| 2    | People around me, always thinking of taking care of my toenails that grow into / thicken by a wound nurse specialist | 84.9 |
| 3    | Family and friends expect me to carry out self-examination of the joints on my legs regularly | 87.1 |
| 4    | Other diabetics expect me to ....... use the right foot for the size of my foot | 62.4 |
| 5    | Other diabetics will .......... if they check the shoes before wearing them | 78.5 |
| 6    | Other diabetics say I ... thin the calluses on my feet by wound nurse specialists | 69.9 |
| 7    | People around me ... ... if moisturizing cream is not given between my toes | 43.3 |
| 8    | Monitoring feet every year on foot deformities / history of injuries done by other diabetics is ... for me | 83.3 |
| 9    | Cutting nails straight which according to the diabetics I have to do is ...... for me | 80.7 |
| 10   | Approval of the people around me about the use of footwear (shoes / sandals) at any time both inside and outside the house ...... for me | 81.7 |
| 11   | The opinion of other diabetes mellitus patients who agree that nail care is growing into / thickened by a specialist nurse wound ... for me | 81.7 |

Note. Item Number of 1 to 3 includes direct subjective norms while 4 to 11 includes indirect subjective norms, Number of 4 to 7 answer options -3 s.d +3

Subjective norm variables described in Table 4 illustrate that the percentage of respondents' total answers is more in the sub-variable direct subjective norm with a higher percentage of total scores in patients who think strongly agree that family and friends of patients expect patients to examine the presence of bone / joint protrusions routine is as much as 87.1%. While indirect subjective norms, the percentage of respondents' answer scores is higher for respondents who argue that doing foot examinations on deformities performed by other DM sufferers is very important for patients, namely 83.3%.
Table 5 The percentage of participants on behavioral control who have a high level of control of foot care (n=93)

| Item | Statement                                                                 | Answer (%) |
|------|---------------------------------------------------------------------------|------------|
| 1    | I am sure that I can check for signs of boils on my legs if I want        | 94.6       |
| 2    | Check my shoes and footwear regularly, depending on my own will           | 93.6       |
| 3    | For me to check my own feet every day for blisters, scratches or boils    | 78.5       |
| 4    | The footwear (shoes / sandals) that I use do not match the size of my feet| 74.2       |
| 5    | When I wash my feet every day with warm water I feel rushed               | 69.9       |
| 6    | The foot cos I use doesn't fit my feet                                   | 74.2       |
| 7    | When I check my feet every day for cuts / abrasions I feel rushed         | 72.1       |
| 8    | If the footwear (shoes / sandals) that I use do not match the size of my feet, I ... for abrasions on the feet | 67.8       |
| 9    | If I am in a hurry when washing my feet with warm water, then I clean it up to between my toes | 63.4       |
| 10   | If the leg cost I use is not right, then ... ... to have a blister on my leg | 79.6       |
| 11   | If I check my feet in a hurry, then I ... to detect any blisters on my feet | 69.9       |

Note. Item number of 1 to 3 including direct behavior control 4 to 11 including indirect behavior control, Number of 8 to 11 choices of answer -3 to +3

In Table 5 which describes the control of the behavior of patients on foot care shows that the total percentage of respondents' answers scores more on the subvariables of direct behavioral control which argues that the patient is sure to check for signs of boils on his legs if he wants 94.6%. While indirect behavioral control that it is likely to cause cuts / abrasions at the foot if the socks used are not right shows the percentage of respondents' answers that are more 79.6%.

DISCUSSIONS

Theory of Planned Behavior (TPB) is a theory of individual health promotion behavior models in nursing where attitudes and knowledge as a determinant of behavior (Pender, Murdaugh, Parsons, & Ann, 2006). This study describes the behavior of TPB-based foot care, which means that a person is able to promote the behavior of virgin feet based on knowledge and attitude.

The main factor of TPB is the individual's intention to conduct behavior. According to this theory, there are 3 variables that will predict intentions, namely attitudes, subjective norms and behavioral controls. Attitude which means psychological tendencies expressed by evaluating both preferred and non-behavioral behaviors, subjective norms (subjective norms) are individual perceptions of certain behaviors that are influenced by other people's research (family, parents, friends), behavior control (perceived behavior control is the ease or difficulty of a person to conduct behavior, while intention (intention) is the readiness of a person to perform certain behaviors. The three predictor variables can be expressed either directly which means overall of a person's attitude while indirectly means a person's beliefs and evaluation of specific results (Ajzen, 1991).

The result of the study on the demographics of respondents that based on the age of more DM patients in the category of early elderly (46-55 years) is 44.1%, with an average age of 53.05 ± 8.047 years. Increasing age is related to the aging factor will lead to a process of accumulation of visceral fat in the body thus causing a decrease in glucose tolerance which will lead to the development of diabetes (Ozougwu, Obimba, Belonwu, & Unakalamba, 2013). A finding of DM patients with an average age of 46-60 has a higher percentage, so age is significantly associated with T2DM (Ekpenyong et al., 2012). Riskesdas study data in Indonesia shows that people suffering from diabetes increases at the age of > 45 and increases over > 55 years (Indonesia, 2013).

People with higher education level are more likely to suffer from DM, which is 36.6%. These results indicate that some respondents
have a higher level of education, in other words that having higher education is expected to increase one's knowledge, especially diabetes care. Data from riskesdes, in Indonesia, indeed someone with a higher level of education is suffering from diabetes (Indonesia, 2013). Percentage of female sex with diabetes is more than males, namely 73.1%. The risk of type 2 DM is closely related to gender (Black & Hawks, 2014). This data contrasts with the study of the prevalence of type 2 DM more commonly found in male gender (Ekpenyong et al., 2012). But in Indonesia according to Riskesdas data shows more women suffer from DM compared to men (Indonesia, 2013).

In terms of employment, there were 41.9% of participants are housewives. This was due to the fact that the DM patients in this study were the majority of women. In fact women are more concerned with work at home and tend to stress and they may not have time to exercise. Lack of physical activity (exercise: aerobics) and stress are the precipitating environmental factors for the occurrence of DM (Black & Hawks, 2014). In theory, DM type 2 occurs due to the disturbing effect of glucose uptake, excess fat accumulation due to physical inactivity (Lin & Sun, 2010). Average blood sugar levels of all respondents both fasting and post-meal blood sugar were 273.96, ± 99.12 mg / dL. This value indicates that someone has been diagnosed with diabetes. The diagnostic criteria for diabetes mellitus is if fasting blood glucose level is ≥ 126 mg / dL or blood glucose 2 hours after meals is ≥ 200 (American Diabetes Association, 2016).

The results of the analysis of the TPB variable illustrate that, intention to wear shoes / sandals, according to size both inside and outside the home, shows a higher percentage. This means that more patients diagnosed with DM have readiness (there is a plan) to perform foot care related to the use of footwear according to size (Yusuf et al., 2016), that the use of shoes is the main predictor of patients with DM who are at risk for injury. The use of sandals both inside and outside the home will minimize the risk for injuries, and shoes that are not suitable or too narrow are the main causes of foot ulceration (Schaper et al., 2016). Intention is the main precursor or determinant of behavior change. The stronger the intention to conduct behavior, the greater the performance (Ajzen, 1991). In other words, the more someone's intention to use footwear according to size both inside and outside the house, then it is possible to have a stronger change. Actions of behavior changes to foot care in DM patients on a regular basis will be less risk for injury (Tiwari et al., 2012).

The majority of respondents showed their attitude that washing their feet every day with warm water was a very good form of practice and positive things that needed to be done. In other words, the treatment of washing feet that they will do is a form of good skill and can provide benefits. Related to the subjective norm, the majority of respondents have the perception that the answers strongly agree with the support of family / friends to conduct an examination of the presence of bones / joints that protrude in the legs independently and it is important for patients to examine foot deformities like what other DM patients have done. This means that patients assume there is support from the closest people to what they will do and anything that other DM sufferers do according to the patient is very important. Whereas, in terms of behavioral control, most respondents thought that they could check for signs of ulcers when they wanted and they were sure there would be a wound if the socks were not suitable. This means that there is control in patients about the risks of what they do regarding foot care. Care for the feet by washing feet every day with warm water, regular checks on the presence of bone / joint protrusions in the area of the feet, confirmation of the feet against deformities / history of wounds, examination of signs of boils in the legs, proper use of socks is management of foot care for Diabetic sufferers to minimize risk (Bakker et al., 2012).

Overall these results illustrate that the majority of respondents with diabetes mellitus in the City of Kendari have an attitude that what they
do is a form of good practice / skill, positive for themselves, quite useful, and good perception / confidence in what is done by the people around them are very important, there is support from the family, and they have the confidence to control what they do if it is not appropriate will cause losses related to foot care, so there will be intention (readiness) in themselves to perform foot care regularly with hope there are no complications such as the presence of diabetic foot injuries especially if amputation occurs. In a combination of attitudes toward behavior, subjective norms and perceptions of behavioral control lead to the formation of behavioral intentions. The better subjective attitudes and norms and the greater the perceived control, the stronger the intention or desire of someone to do the related behavior (Ajzen, 2002; Noar & Zimmerman, 2005).

Intention to do various types of behavior can be predicted with high accuracy from attitudes toward behavior, subjective norms, and perception of behavioral control (Ajzen, 1991). In fact this finding reveals that the majority of respondents have a positive attitude, there is pressure / support for the people around them (family and friends) and there are behavioral controls related to foot care, as well as stating the intention to perform regular foot care. Therefore, patients diagnosed with diabetes through an inner intention to perform routine foot care which is predicted by attitudes, subjective norms and behavioral control are expected to reduce or minimize the risk of complications such as the occurrence of diabetic foot injuries.

CONCLUSION

Most of the respondents in this study show that there was an intention, positive attitude, social pressure from close people and behavioral controls related to diabetic foot care. Patients with diabetes mellitus are expected to carry out regular foot care to minimize the complications of diabetic foot injuries.

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INDONESIAN PRIMARY CARE THROUGH UNIVERSAL HEALTH COVERAGE SYSTEMS: A FEELING IN BONES

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Abstract

Jaminan Kesehatan Nasional or JKN realized as the one of problem solving for equity of healthcare in Indonesian setting. At the same point, it has to compatible with all aspects in health financing issues by its newly adopted systems. This review aims to reveal JKN health financing policy since it implemented by 2014 in Indonesia. Several bibliographies databases were identified to conduct literature reviews that comprised of international and national/local journals. It founds that JKN principles focuses on mutual support, not-for-profit, good governance, and portability aspects. JKN enrollment consisted of two types polisherholders including incapable polis insurance (PBI JKN) that bear by the Indonesian government, and capable polis insurance (none PBI JKN). JKN have to synergize with recent existing challenges including integration from previous regional health insurance (Jamkesda), healthcare facilities, package benefit, financing issue as well as the deficit issue which happened as lower dues that making by JKN polisherholder than the high claim by the healthcare facilities particularly in hospitals. Although, JKN emerges to tackle the inequity of healthcare in all Indonesian regions, the existing settled Jamkesda in several regions, particularly regions with high regional income, made JKN integration as the setback health financing on its regions. Limited healthcare facilities that cooperated with BPJS-Kesehatan also challenged the JKN implementation as well as financial lose in affecting by mismatch between medical expenditures with JKN claimed as per package. It concludes that the political willing to choose several options including to prevent JKN deficit depend on the leader commitment to make JKN as not for another journey but it shall be the destination for health financing in Indonesia.

Keywords: health financing, universal health coverage, health insurance, national health insurance, Indonesia

Introduction

Health care is the most needed care by anyone that wants to healthy living that could not be negotiated. Sometime, it is no matter how much people have to pay for having healthcare, particularly in developing country setting such as Indonesia. Indonesian public health systems are currently providing an ideally social security assurance for health, namely Indonesian universal health coverage (Jaminan Kesehatan Nasional or JKN). In previous circumstances, Indonesian people tent to achieve standard healthcare by cost (out of pocket), but if they uncapable to afford it, they will resisted by healthcare providers as a formed of violation to both patient and human rights (Widjaja, 2014). In this case, a healthcare facility more likely neoliberal than where it depended on how much money they...
can obtain from patient. Meanwhile, other developing countries have already successfully implemented their newly and reformed health systems almost in detail family medicine including new structure of primary care (Pölluste & Lember, 2016; Tkachenko, 2017). Otherwise, it also varied by fraud or inappropriate healthcare that included maximum drug or therapy referred while the same outcome but cheaper than out-off pocket were available (Aspinall, 2014).

In this era, JKN presents a health system that has enabled the health expenditure that is no longer burdening the patient. The financial bussines of this system runs by an independent management agency for health namely national healthcare security committee (Badan Penyelenggara Jaminan Sosial Kesehatan or BPJS-Kesehatan) (Mboi, 2015).

METHODS

In this review, the literatures were search in both international and local bibliographic sources i.e. MEDLINE, EMBASE, CINAHL, Cochrane Library, Science Direct, ProQuest, WHO SEARO database, SCOPUS, Wiley Library, SAGE, Taylor & Francis, SpringerLink, Hindawi, and Directory of Open Access Journals (DOAJ). This study also search literature not listed in the above bibliographic resources using Indonesian Portal Indexing (IPI), and it examined the recent literature on the current issue and prospects for the current health insurance of Indonesia with JKN as a main outcome for the review discussion resulting from the government policy associated with update circumstance of Indonesian JKN in numerous studies.

PRINCIPLE

BPJS-Kesehatan system that underlined systematic step to ensure the JKN conservative fund for utilized efficiently (Indonesian Government, 2004). Healthcare provider is paid by prospectively such as capitation, casemix based group (CBG) or in specific budgeting. For example, Indonesian government is commited that there are only two ways to paid it that consisted of capitation and CBG (PerPres RI, 2013). BPJS-Kesehatan in health facilities discussed about standard cost of healthcare on both primary and secondary health facilities that determined by the claim of diagnose related system as well as in CBG (Indriani, Kusnanto, Ghuftron Mukti, & Kuntoro, 2013). CBG is not only utilizing by uncapable patient but also it uses by capable registrant. Capable registrant is meaning as polishanded of JKN who covered their health assurance by themselves. Meanwhile, uncapable registrant that unable to paid their health assurance, so the government has to pay it for them. CBG model applied the claim payment of JKN to the healthcare facilities based on healthcare packaging that formed by the group of disease diagnostics (Hadning, Ikawati, & Andayani, 2015; Hasanah, Mahawati, & Ernawati, 2013). CBG tariff was concluded and it issued by 10th International Code for Disease (ICD X). Periodically, this code shall be revised and analyzed for the appropriateness circumstance of healthcare facilities’s data and it also reviewed the previous JKN implementation in order to produce and fixing the cost method’s calculation (Mundiharno & Thabrany, 2012).

JKN principles are comprised of following: (a) Mutual support; as major core of JKN principle which is meaning spirit and practice when capable helps noncapable participant, low risk helps high risk, and the healthy supports the sick. These three components are not happened on comercial health insurance, so it shall be realized social equity for all society. (b) Not-for-profit; shall not be beneficiary on either of partial people or board executive, which also called shareholders. Legally, it collected as trust fund and utilised for healthcare payment. (c) Good governance; consisted of openness, caution, accountability, efficiency and efectivity. It included of policies, revenues, expenditures, investments, and any others transactions should be recorded and archived for surely. External audit board obligated to examine and verified it publicly. Otherwise,
chief of BPJS-Kesehatan have published the accountability and audit results publicly on official website. (d) Portability; meant participant to not only produce benefit, but also healthcare that became participant’s rights (Mboi, 2015). Portable also expressed mobility that is valid on all healthcare entities and it is following the dynamic of participant’s needs. BPJS-Kesehatan also cannot impose restriction of assurance in any region or area in any setting of populations.

**ENROLLMENT**

In the meaning of the participant is any person, including a foreigner who works for a minimum of 6 (six) months in Indonesia, who has paid the dues. While the worker is any person, who works by receiving the salary, wages, or other forms of remuneration. Participants include JKN incapable polis insurance (PBI) and none PBI JKN with details as follows:

| JKN enrollment procedures (Indonesian Government, 2004, 2011) |
|---------------------------------------------------------------|
| **Table 1** |
| **JKN enrollment procedures** |
| **JKN mechanism of registration** |

| **PBI JKN** | **None PBI JKN** |
|----------------|------------------|
| Participants consisted of people who categorized as poor and disadvantaged. | Wage-earning workers and members of their families, namely: civil servants, members of the military (TNI); members of the police; state officials; non-government employee; government employee; private employees |
| Registration requirement, terms of registration will be arranged later in BPJS-Kesehatan rules | Registration location for Participant Registration have done at the nearest/local BPJS-Kesehatan office |

| **Non-beneficiary workers and their family members, namely:** | **Participant registration procedure** |
|----------------|-----------------------------------|
| a. workers outside the employment relationship or self-employed | 1) The government registered PBI JKN as a member to BPJS-Kesehatan. |
| b. workers who do not include letter a who are not wage earners. | 2) Employers enrolled their workers or workers enrolled as members to BPJS-Kesehatan. |
| c. workers as referred to letters a and b, including foreign citizens countries working in Indonesia for a minimum period of 6 (six) months. | 3) Not-workers and other participants are required to self-register their selves and their family as members to BPJS-Kesehatan. |

| **Non-workers and members of their families consist of:** | **Rights and obligations of the Participant** |
|----------------|-----------------------------------------------|
| investors; employer; pension recipients; veteran; pioneer of independence | Every participant who has enrolled in BPJS-Kesehatan entitled to: a) the identity of the Participant and b) the benefits of health services at the Health Facility which had collaboration with BPJS-Kesehatan. Every participant who has registered with BPJS Kesehatan have obligatory to: a) pay dues and; b) report membership data to BPJS-Kesehatan by showing the identity of the participant when moving domicile/or transferring work. |

| **The pension recipients consist of:** | **Phasing of membership** |
|----------------|------------------|
| civil servants who have retired with the right to retirement; members of the TNI and members of the | JKN participation shall conduct in several stages. The first phase commencing on 1st January 2014, where its membership shall include at least the following: PBI JKN; members |

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JKN enrollment types

- police who stopped with the right pension.

JKN mechanism of registration

- of the TNI/civil servants within the Indonesian Ministry of Defense along with their families; members of police/civil servants within the Indonesian Police along with their families; health insurance participant of PT Askes along with their families, and participant of Jamsostek along with their families member. Furthermore, the second phase included all residents who have not entered as participants of BPJS-Kesehatan for enrolled no later than January 1, 2019.

CHALLENGES

Integration From Previous Regional Health Insurance

JKN program is expected to provide many changes to the health system in Indonesia, such as financing management, health service management, information management, cross-sector coordination, and others. Furthermore, the system is also expected to affect other aspects beyond the health system itself, such as economic aspects; business aspect, employment aspect, and wage aspect; aspects of poverty reduction and social protection; up to aspects of data collection and population registration. Participants of JKN as of January 1, 2014, were participants of health insurance programs that are transferred directly to JKN program, namely Jamkesmas participants, civil servant health insurance (Askes PNS), military health insurance (Askes TNI/POLRI), and health assurance network for labor (JPK Jamsostek). From that moment onwards, BPJS-Kesehatan opened registration for every citizen who wanted to register JKN, either individual, through the company, or through local government as Local Contribution Receiver (PBI). BPJS-Kesehatan estimated the number of participants JKN as of January 1, 2014, as much as 48.2% of the total population of Indonesia (Widodo, 2014), or as many as 110.4 million people. The President Act of Health Insurance mandates that all Indonesian citizens should be registered as JKN participants in achieving Universal Health Coverage (UHC) in 2019 (Supriyantoro & Hendarwan, 2014).
Previously, all provinces in Indonesia have already a regional health insurance (Jamkesda) respectively with there were four provinces that have settled Jamkesda financing (Supriyantoro, Hendarwan, & Savithri, 2014). The number of provinces that only guarantee the participants of none Jamkesmas poor were 27 provinces (81.81%), while two provinces (6.06%) using uncappable recommendation that issued by incapability-confirmed letter (SKTM) (Supriyantoro & Hendarwan, 2014). It indicated that the understanding and ability of each regions in Jamkesda management were varied, especially to achieve settled Universal Health Coverage (UHC).

Based on the characteristics and feasibility analysis of Jamkesda policy in 6 provinces, there were several points to consider in the formulation of the integration policy formulation as follows: 1) The existing regulations and action plan at the provincial level which would determine the how far the Jamkesda integration process works well; 2) The political commitment of regional leaders, which was in general it should be visionary regarding to the preparation of JKN implementation after; 3) Field preparedness which was also a key that should wellprepare during the Jamkesda integration process into the JKN, concerning limited access, availability of health services and BPJS-Kesehatan that distributed evenly and the quality of standards, as well as the level of knowledge/awareness of the community; 4) The ability of regions to adjust Jamkesda policies compiled with the regional middle development plan (RPJMD) performance indicators which was essential in the integration process, as it should synergy in each region respectively; 5) Economic and financial factors, particularly the readiness of local budgets with determination the readiness of regions to integrate; 6) Result basis financing that may bridging the existing system differences and improve performance both concerning to supply and demand from health systems in achieving Universal Health Coverage (Supriyantoro & Hendarwan, 2014; Supriyantoro et al., 2014).

Health Facility
Implementation of the JKN led to increased utilization of services in health facilities, especially hospitals (Nugraheni, 2015). Integration into JKN Jamkesda participants would also be escalated the number of service utilization (Ambiriani, 2014; Supriyantoro & Hendarwan, 2014). Several problems shown in relating to the limited healthcare facilities that caused people cannot take advantage of these health facilities despite having health insurance. For example, the case of patients who end up having to find another hospital after a very long wait for a treatment room, a patient rejected by the hospital, especially those needing the emergency care such as ICU (Sandhyaduhita et al., 2016). In relating with the rise of PBI JKN patient rejection by the hospitals, this issue triggered the moral hazard that harmed the community and the patient to declared theirselves as a general patient so it can be served faster and more secure than if admitted as a JKN patient whose responded by slowly and unfriendly from the hospitals.

Package Benefits
Concerning benefit package for PBI JKN, Presidential Act No.12 of 2013 has clearly stated details of benefits received by PBI (Pemerintah RI, 2013). However, in practice, the benefits package not entirely obtained by patients or due to poor hospital management that affected patients have to spend their money (out-of-pocket) to fulfill the needs of health care (Veruswati & Asyary, 2017b). Also, the benefits package in JKN does not adequately fulfill the needs of particular patients, for example, specified drugs according to the national formulary (Fornas) (H Thabrany & Abidin, 2017). In BPJS-Kesehatan perception, Fornas drugs has been fully met the standard needs of the treatment (Indonesian Government, 2011). In fact, several hospitals made patients to out-off-pocket for particular receipt in pharmacies outside the hospital (Veruswati & Asyary, 2017a). Furthermore, Fornas itself is a list of drugs that do not include the trading name of medicine and it only written as the active substance of the drug (Pemerintah RI, 2015). Thus, it led the hospitals to made patient that
have to pay for anonymous trading name of the drug as caused by unavailability of the *Fornas* medication. On the implementation of JKN, it should be able to encourage hospitals to improve the management of services including providing the stock of medicines and medical supplies in considering the increased utilization of health facilities.

Besides, the hospitals complained about the difficulty of accessing e-catalog (Dwijaji, Sarnianto, Thabrany, & Syarifuddin, 2016; Kusmini, Satibi, & Suryawati, 2016). It carried on as common event as e-catalogs run the mechanism for the tender of medicines and medical consumables needed in government health facilities (Hasbullah Thabrany, Sari, Tilden, Dunlop, & Hajaraeni, 2015). The hospital in collaboration with *BPJS-Kesehatan* should cooperate with pharmacies which appointed by *BPJS-Kesehatan* to provide medication for JKN participants. It indicated that the government still needs to educate and provide the explanation for the private sector that cooperates with *BPJS-Kesehatan* and prevent patient’s rejection by the hospitals.

**Deficit**

As a newly-innovate insurance, *JKN* is aimed to afford health equity access for all Indonesian mankind. *JKN* alongside with Health Indonesian Card (Kartu Indonesia Sehat or KIS) have succeeded to covering more than 178 millions (more than 60%) of Indonesian society (*BPJS Kesehatan*, 2017). Otherwise, *JKN-KIS* allowed increasing Indonesian people to have their health insurance in such a way (Andria & Kusnadi, 2017; Habibie, Hardjosoekarto, & Kasim, 2017). Based on enrolment distribution data of The National Healthcare Security Committee (*Badan Penyelenggara Jaminan Sosial Kesehatan* or *BPJS-Kesehatan*) on March 2017, participant still enrolled dominantly by Recipient of Contribution Subsidy (Penerima Bantuan Iuran or PBI) with 52% rather than the other policyholders (24% employee, 12% non-employee/entrepreneur, 3% government shareholders, and 9% integration from previous local government health assurance or Jamkesda) (*BPJS Kesehatan*, 2017).

One of the basic huge problems is emerging as unequally between total revenue that is coming through participant subscription received with total expenditure both for claimed payment (hospital) and capitation (health center) that called mismatch. It should be acknowledge that mismatch is hardly to avoid as caused by subscription structure that set by the government was below from real actuarial accounting. In fact, actuarial accounting has been calculating and set the cut-off point as ideally subscription for *BPJS-Kesehatan* anyway. However, it decided, always, by considering the political and economics policy. The government amended the subscription amount below actuarial accounting ideally. And automatically, the consequences of these policy felt as current situation (Lestari & Djamaludin, 2017).

In 2015, subscription average was IDR 27,000 per person per month, while its claiming expenditure was reached IDR 33,000 per person per month. Thus, deficit happens IDR 6,000 per person per month with 145 millions participants, so it achieved 10.4 trillions deficit (*BPJS Kesehatan*, 2017). This concludes that *JKN* revenue is still far away from its expenditure. On the other hand, this situation will also influence to quality and pattern of health care. Therefore, the government is essential to improve the fiscal capacity to accommodate health financial needs, including *JKN* financing.

Obviously, the Government Act No. 24 of 2011 about *BPJS-Kesehatan* had been amended the mechanism of *JKN* financing. Unfortunately, its financial regulation have not detailed as expected yet, while it hopes that it can be cover whether with government regulation No. 87 of 2013 about Management of Health Social Assurance Asset or the revised version as government regulation No. 84 of 2015, however, it seems that these latest regulations were only the repetition from the prior act without any particular meaningful in addition.

There are several options to avoid mismatch in future deadlock for further. According to the
Government Act No. 24 of 2011 about BPJS-Kesehatan, article 43 set about asset of social assurance fund of BPJS-Kesehatan could be origin by: (a) social assurance subscription including subsidy subscription; (b) it produces from social assurance fund development; (c) it produces from asset by social assurance program that comes from national companies (Badan Usaha Milik Negara or BUMN); and (d) other legitimately sources that approves by government act and regulation.

Indeed, the mainly factor is changing the subscription participant at least equivalent to actuarial accounting which is by escalating the current subscription participant. However, it should consider the political issue. Meanwhile, investment program seems tantalizing but it is more difficult to regulate either for the profit (Fossati, 2016), investors requirement, and investment methods in such a way (Trisnantoro, Marthias, & Harbianto, 2014).

Otherwise, in effort to interpreting the last option as seeking for other legitimately source is essential to earmarking the best benefit health care (Hasbullah Thabrany & Laborahima, 2016), as well as to reduce the morbidity and mortality, for further.

CONCLUSION

As the singular national health insurance, JKN showed by the powerful policy to adopt its scheme in all of the regions at this country. It indicates that the political commitment is the main venue to implement it beyond the rest factors including current challenges such as the Jamkesda integration and the deficit. These challenges should be the opportunities in making JKN for not only the one of the journeys but the destination of the health insurance in Indonesian.

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Conflict of Interest

The author has no conflict of interest to declare that related to this paper.

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