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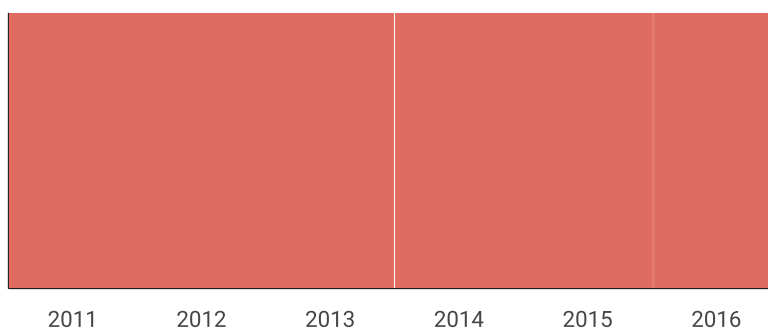
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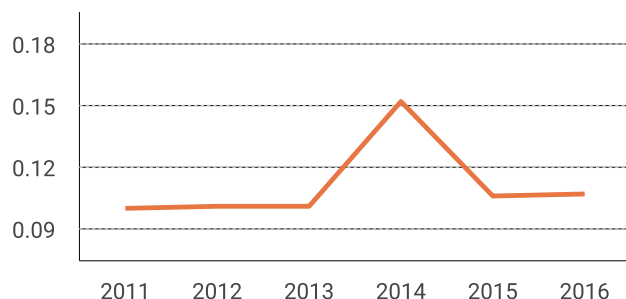
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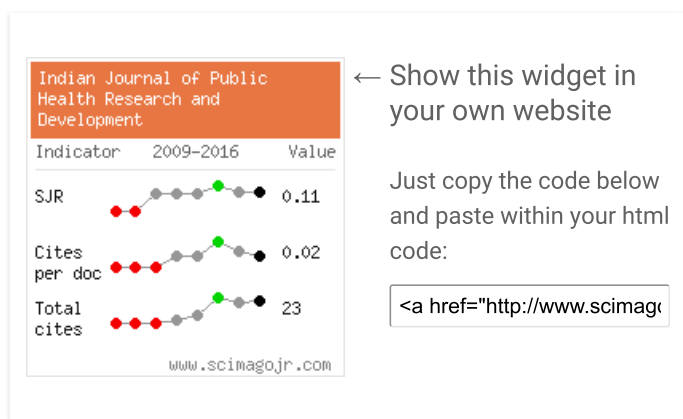
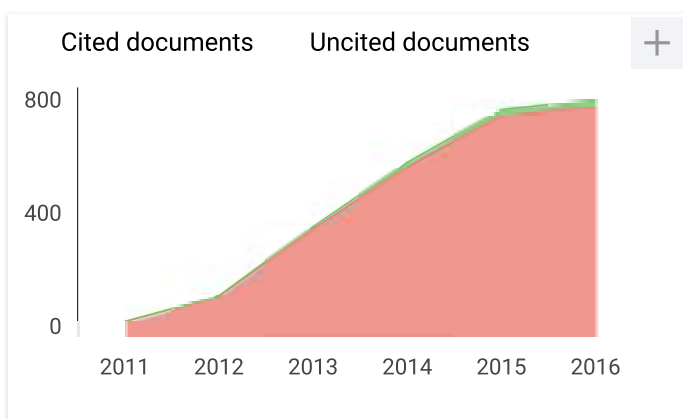
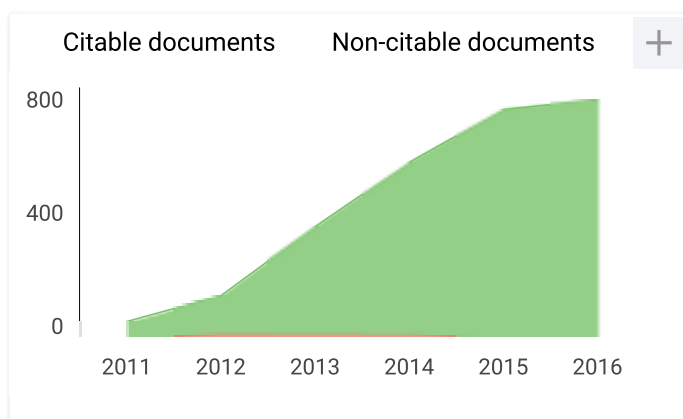
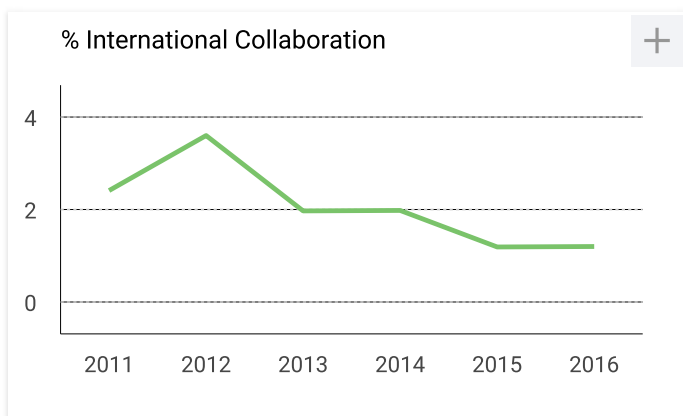
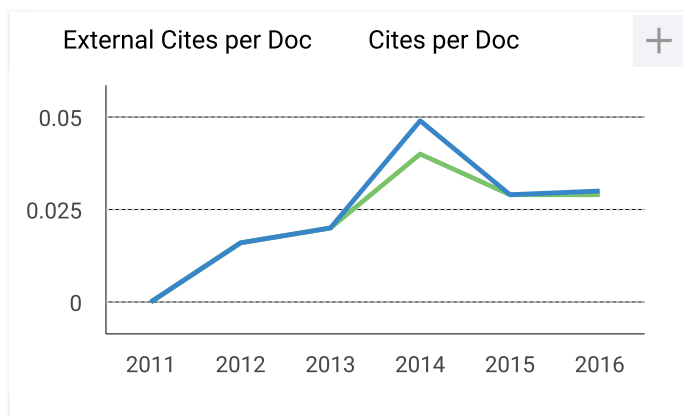
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# Model of Hypertension Transmission Risks to Communities in Gorontalo Province

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## ABSTRACT

Healthy behaviors are actions by individuals to maintain and improve their health, including disease prevention, personal hygiene care, maintenance of fitness through exercise and nutritious food. Healthy behaviors exhibited by individuals who feel that they are medically fit although they are not necessarily truly healthy. Disease prevention behaviors aimed at reducing and limiting all risk factors for the disease. Easily one of the diseases that occur due to behavioral factors are hypertension.

The observational analytic within case control design was used to study the variables with a convenience sample of 150 people with hypertension. The study showed that the self efficacy has a significant effect on self-regulation, with a path coefficient of 0,123 and T-Statistic value of 3,432. Collective efficacy also has a positive and significant impact to self-regulation, with a path coefficient of 0,312 and a value of 10,651 T-Statistic. On the other hand, self-regulation has a positive effect on behavior prevention, with a path coefficient of 0,765 and T-Statistic value of 44,132. Hypertension prevention behaviors have a positive and significant effect on hypertension, with a marked positive path coefficient of 0,889 with a T-Statistic value of 419,54.

**Conclusions:** Self-efficacy and collective efficacy directly affect self-regulation, and then influence the hypertension prevention behavior. It is therefore suggested to create health policy regarding health promotion to communities.

**Keywords:** Risk of transmission, hypertension, Behavioral factor

## INTRODUCTION

Hypertension is well known diseases occurred due to behavioral factors. WHO report showed that 8-18% of the world population suffered from hypertension. According to Basic Health Research in Indonesia, 2011, the prevalence of hypertension on the population over the aged of 18 was 29.8% (based on measurements). While based on the diagnosis or the symptoms assessed by health providers, the prevalence of hypertension among Indonesia Population was around 30.3%. Meanwhile, the prevalence of hypertension in East Nusa Tenggara was 28.1% based measurement and according to a diagnosis of symptoms by health workers was about 38.0%, higher than the national prevalence<sup>1-5,14</sup>.

Provincial Health Department reported regarding the ten highest diseases in 3 (three) last year showed

that the case of hypertension was steadily increased, which in 2009 ranked the nine (9) of 10,211 (3.44%). In 2010 hypertension is 6 (six) rank; 15,431 (5.55%). In 2011, Hypertension badly occupied on the 7 (seven); 12 971 (4.76%). Meanwhile, based on the Surveillance Integrated Health Centers (STP) 2011-2013, the number of new cases of hypertension varied. In 2011 the number of new cases is 4256 (2145 male and 2111 female cases), and in 2012 the number of new cases is about 4121 cases (2012 male and 2109 female cases). In 2013 the case of Hypertension increased dramatically to 4876 cases (2865 male and 2011 female cases)<sup>6</sup>

An Initial study conducted in Gorontalo, 2013 showed that the prevalence of hypertension in Airnona Village was about 40%. The study also showed that 64% people with hypertension practiced unfavorable behavior, while people who are not diagnosed with hypertension

**Table 2 Preventative Behavior of Gorontalo City Year 2015**

Preventive Behavior	Category	Hypertension status		Total N (%)
		Hypertension N (%)	No Hypertension N (%)	
Weight Control	No good	25 (33,3%)	19 (25,4%)	44 (29,4%)
	Less good	8 (10,7%)	11 (14,6%)	19 (12,6%)
	Pretty good	8 (10,7%)	10 (13,3%)	18 (12,0%)
	Good	8 (10,7%)	12 (16,0%)	20 (13,3%)
	Very good	26 (34,6%)	23 (30,7%)	49 (32,7%)
	Total	75 (100%)	75 (100%)	150 (100%)
Dietary habit	No good	29 (38,7%)	25 (33,4%)	54 (36,1%)
	Less good	11 (14,6%)	12 (16,0%)	23 (15,4%)
	Pretty good	1 (1,3%)	3 (4,0%)	4 (2,6%)
	Good	10 (13,4%)	13 (17,3%)	23 (15,3%)
	Very good	24 (32,0%)	22 (29,3%)	46 (30,6%)
	Total	75 (100%)	75 (100%)	150 (100%)
Exercise	No good	28 (37,3%)	30 (40,0%)	58 (38,6%)
	Less good	5 (6,6%)	4 (5,3%)	9 (6,0%)
	Pretty good	2 (2,6%)	5 (6,6%)	7 (4,7%)
	Good	4 (5,3%)	5 (6,6%)	9 (6,0%)
	Very good	36 (48,0%)	31 (41,3%)	67 (44,7%)
	Total	75 (100%)	75 (100%)	150 (100%)
Smoking	No good	46 (61,4%)	43 (57,4%)	89 (59,4%)
	Less good	15 (20,0%)	21 (28,0%)	36 (24,0%)
	Pretty good	9 (12,0%)	5 (6,6%)	14 (9,3%)
	Good	0 (0,0%)	0 (0,0%)	0 (0,0%)
	Very good	5 (6,6%)	6 (8,0%)	11 (7,3%)
	Total	75 (100%)	75 (100%)	150 (100%)
Recreation/ Hoby	No good	13 (17,4%)	10 (13,3%)	23 (15,4%)
	Less good	27 (36,0%)	27 (36,0%)	54 (36,0%)
	Pretty good	15 (20,0%)	24 (32,0%)	39 (26,0%)
	Good	15 (20,0%)	10 (13,4%)	25 (16,6%)
	Very good	5 (6,6%)	4 (5,3%)	9 (6,0%)
	Total	75 (100%)	75 (100%)	150 (100%)

The average age of respondents (X) is 50.15 years, minimum 40 years and maximum 59 years and standard deviation (SD) 6,512. The average age of respondents with hypertension (X) 51, 27 years and standard deviation (SD) 6,024, and average age of respondent is not hypertension (X) 52,12 years and standard deviation (SD) 6,213.



**Table 3. Age of Respondents in Gorontalo City, 2015**

Age (Years)	Hypertension status		Total N (%)
	Hypertension N (%)	No Hypertension N (%)	
40-44	8 (10,7%)	6 (8,0%)	14 (9,3%)
45-49	14 (18,7%)	9 (12,0%)	23 (15,3%)
50-54	19 (25,3%)	21 (28,0%)	40 (26,7%)
55-59	34 (45,3%)	39 (52,0%)	73 (48,7%)
Total	75 (100%)	75 (100%)	150 (100%)

Table 3 shows most respondents aged 55-59 years (45.3%) and at least 40-44 years of age (10.7%). Based on hypertension status most (45.3%) respondents aged 55-59 years with hypertension and 52,0% who are not hypertensive.

**Table 4. Inner Weight, Standard Deviations and Significance**

Effect	Inner Weight	Standard Deviation	t statistic	Explanation
Self Efficacy-> Self Regulation	0,123	±0,044	3,432	Significant
Colective Efficacy-> Self Regulation	0,312	±0,028	10,651	Significant
Self Regulation-> behavior Prevention	0,765	±0,019	44,132	Significant
Behaviour Prevention -> hypertension	0,889	±0,002	41,954	Significant

Table 4 shows the value of T-statistics greater than 1, 96. It can be concluded that exogenous variables directly affects endogenous variables.

The results of the blood pressure measurements and then classified by the Joint sNational Committee VII, as shown in Table 5 :

**Table 5. Blood Pressure Classification Society Gorontalo, Year 2015**

Blood Pressure ( mmHg)	Hypertension Status		Total N (%)
	Hypertension N (%)	no Hypertension N (%)	
Normal ≤ 120/80	0 (0,0%)	45 (60,0%)	45 (30,0%)
Pre Hypertension : 120 - 139 / 80 - 89	0 (0,0%)	30(40,0%)	30 (20,0%)
Hypertension stage 1: 140 - 159 / 90 - 99	40(53,3%)	0(0,0%)	40 (26,7%)
Hypertension stage 2: ≥160/ 110	35(46,7%)	0(0,0%)	35 (23,3%)
Total	75 (100%)	75 (100%)	150(100%)

The majority of respondents (53.3%) are categorized as stage hypertension and 46.7% are stage II hypertension and 60.0% of people have normal Blood Pressure as shown in table 5.

## DISCUSSION

Collective efficacy directly influences the self-regulation. Therefore, groups and family belief's will create individual trust manage and cope threats. Social support plays a crucial role to develop groups' ability to manage and control the group. Collective efficacy creates a trust relationship among community members and shared willingness to achieve goals. The capacity to do informal social control and social cohesion are the core factors to attain community objectives. Model of self-regulation is based on three components (interpretation, coping and appraisal) which connected each other to maintain balance. Consequence, if an individual is getting sick, according to the model the individuals then are motivated to recover. Motivation can be defined as internal and external factors including 1) the desire and interest to do the activities, 2) the encouragement and needs to perform activities, 3) the expectations and ideals, 4) self respect and appreciation, 5) good environment, and 6) the existence of interesting activities<sup>2,3</sup>.

Self-regulation affects on hypertension prevention behaviors. An Initial study to analyze the related factors to self-regulation; men and women were shown to have attitudes, subjective norm, and anticipated positive emotions to reduce and maintain blood pressure (Baghianimoghadam, et al, 2011). The Behavioral act or practice is focused on activities taken by individual in order to maintain health including knowledge, attitude and practice. There are four indicators for practice; (1) The act or practice related to infectious and non-infectious diseases, (2) The act or practice with respect to the factors that influence health, (3) the act or practice to access health care facilities, (4) the act or practice to avoid accidents both household accidents, traffic or in public places<sup>8-11,14</sup>.

The results showed hypertension prevention behaviors directly affect hypertension. The study revealed that most of the respondents do not really care about hypertension prevention behaviors (bad category) such as weight controls behavior, diet control, and smoking. Even though some of the prevention behaviors are performed in a good way of practice such as exercise, and relaxing time, the practice of prevention behavior to Hypertension by people in Gorontalo is not fully executed. Most of the people used to drink alcohol and coffee, eating salty food, and excessive smoking which

can interference body metabolism<sup>12-15</sup>

## CONCLUSION AND RECCOMENDATIONS

In conclusion, Self-efficacy and collective efficacy directly affects self-regulation, and then influence the hypertension prevention behavior. It is therefore suggested to create health policy regarding health promotion to communities. Further research needed is to implement the prevention model to improve efficacy Self-efficacy and collective-efficacy.

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**Conflict of Interest:** Author declare that there is no any conflict of interest within this publication

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**Cont... Table 1. Overview of the Efficacy of the People of Gorontalo City. Year 2015**

Verbal Persuasion	No good	9 (12.0%)	4 (5.4%)	13 (8.6%)
	Less good	10 (13.3%)	12 (16.0%)	22 (14.7%)
	Pretty good	21 (28.1%)	19 (25.3%)	40 (26.7%)
	Good	13 (17.3%)	24 (32.0%)	37 (24.7%)
	Very good	22 (29.3%)	16 (21.3%)	38 (25.3%)
	Total	75 (100%)	90 (100%)	150 (100%)
Emotional State	No good	2 (2.6%)	2 (2.6%)	4 (2.7%)
	Less good	5 (6.7%)	3 (4.0%)	8 (5.3%)
	Pretty good	8 (10.7%)	10 (13.4%)	18 (12.0%)
	Good	30 (40.0%)	30 (40.0%)	60 (40.0%)
	Very good	30 (40.0%)	30 (40.0%)	60 (40.0%)
	Total	75 (100%)	75 (100%)	150 (100%)

Other results showed that collective efficacy has the significant and positive effect on self-regulation. It can be observed from the positive path coefficient that is 0.312 with T-Statistic 10.651 which is greater than 1, 96. Community perception of Collective efficacy is quite high. The result revealed that 42.2% of community perception are good category. Based on diagnosis, 34.4% people with hypertension and (50.0 %) without hypertension are classified as good.

Self-regulation has a significant and positive effect on behavior prevention. The path coefficient exists on positive mark that is 0.765 with T-statistic value about 44.132, greater than 1.96. Community perception about self-regulation or self-management ability from external factors is counted at 18.71% unfavorable category. Moreover, 23.97% Hypertension people's self-management ability is bad category, while people without hypertension is counted at 22.3% regarding good enough self-management. For the Internal factors, 31.8% are pretty good.

Prevention behaviors showed a positive and significant effect on hypertension. This is evident from the marked positive path coefficient of 0.862 with T-Statistic valued at 417.621 greater than 1, 96. Behavior prevention practiced by people in Gorontalo

City consists of weight control, diet, exercise/ sports, restrict smoking habits and doing leisure activities and hobbies. The results showed that 28.9 % people always doing such activity to control their weight. While, 30.9 % people who have already experienced Hypertension, does not do sufficient exercise, and 26.5% people without hypertension are always doing exercise. On the other hand 31.2% people cannot control diet (bad category). Regarding the hypertension status, 34.1% people with Hypertension cannot control their diet and 33.1% people without hypertension have good self-management in terms of diet control.

Exercise has strongly believed to control Hypertension. The study showed that 38.9% people have very good intention for exercise. Based on hypertension status, 42.6% diagnosed by Hypertension rarely do exercise, while for those without hypertension that is 40.3% are doing exercise (good category). Smoking is one of the modifiable factors for Hypertension. The study revealed that 59.4% respondent used to smoke. Moreover 61.4% respondents who diagnosed by Hypertension experienced to smoke, and 57.4% do not smoke. Another factor to control Hypertension is having more time for relaxation. The study found that only 36.0% respondents are using their leisure for relaxation.

are about 46%. In Comparison to the study conducted in 2014, there were 35.07% of people with hypertension have a historical family of hypertension with low level of knowledge in terms of hypertension prevention. Other results showed that most of the respondents had bad behavior especially in doing exercise which accounted 48%; 66.5% had a bad habit in consuming salty foods, 76.1% consumed fatty foods, and 67.44% of respondents consumed alcohol and 32.1% smoked. Those risky Behaviors such as consuming fatty foods were existed and becoming an obligation for communities during traditional party and easily found in several restaurants in Gorontalo. People's behavior is mostly influenced by the culture in which some of the foods are should be presented on the traditional party and low level of the plant-derived food due the geographical condition and drought<sup>9-11,14</sup>

## MATERIAL AND METHOD

The research was conducted in Gorontalo city during January to April 2015. The observational analytic study, with case-control study design is used to analyze the variables. The two-stage cluster random technique is used which then started from cluster neighborhoods (Rukun warga), and cluster neighborhood (rukun tetangga) and finally sample unit random. The sample size is about 150 people who have a historical family member with Hypertension, which then divided into two groups; 75 people with hypertension and 75 people

are not hypertensive. Instruments used in the study is mercury tension meter to measure BP, twice and followed by interview using developed questionnaire. Structural equation modeling Variance-based or component based or Smart Partial Least Square (Smart-PLS) is used to analyze the study.

## RESULTS

The study showed that Self-efficacy has a significant and positive effect on self-regulation. The fact can be observed from the positive path coefficient of 0,123 with T-statistic a value of 3,432 which is greater than 1,96. The study also showed that the self-efficacy's people in Gorontalo are high. The results showed 32,7% of respondents have the good perception of self-experience. Based on Hypertension status, self-experience was 26.7% in people with hypertension and 38.6% in people who are not diagnosed with hypertension is categorized as good. Other people's experiences, about 40,7% are a good category. While based on hypertension status, other people's experience who are diagnosed and are not diagnosed with hypertension is mostly categorized in good and very good, 52,0% and 29.3% successively. While for verbal persuasion, 24.7% of them are good category. For those with Hypertension, 29,3% have good verbal persuasion and 32,0% of those without hypertension have excellent verbal persuasion. For Emotional state variable; 40,0% respondents have good perception in terms of the emotional state.

Table 1. Overview of the Efficacy of the People of Gorontalo City. Year 2015

Self Efficacy	Category	Hypertension Status		Total N (%)
		Hypertension N (%)	No Hypertension N (%)	
Self experience	No good Less good	9 (12,0%) 7 (9,4%)	5 (6,7%) 8 (10,7%)	14 (9,3%) 15 (10,0%)
	Pretty good	20 (26,7%)	20 (26,7%)	40 (26,6%)
	Good	20 (26,7%)	29 (38,6%)	49 (32,7%)
	Very good	19 (25,2%)	13 (17,3%)	32 (21,4%)
	Total	75 (100%)	75 (100%)	150 (100%)
People Experience	No good	4 (5,4%)	2 (2,7%)	6 (4,0%)
	Less good	10 (13,3%)	7 (9,3%)	17 (11,3%)
	Pretty good	17 (22,7%)	14 (18,7%)	31 (20,6%)
	Good	22 (29,3%)	39 (52,0%)	61 (40,7%)
	Very good	22 (29,3%)	13 (17,3%)	35 (23,4%)
	Total	75 (100%)	75 (100%)	150 (100%)