# Improved adherence status in patients with hypertension; a community-based intervention

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JOHNS HOPKINS
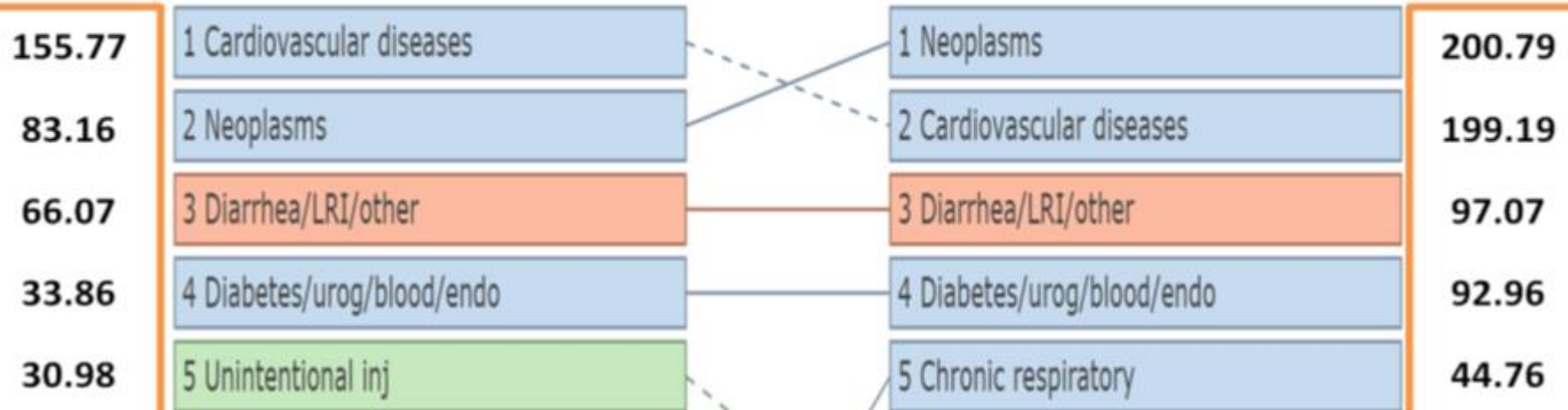SCHOOL of NURSING

# Thailand at a Glance

- Population: 65,300,000

- GNI Per capita income: US$15,210

- Percent urban: 50%

- Life expectancy at birth women/men: 79/72 yrs.

**Thailand**
**Both sexes, All ages, Deaths per 100,000**

| 1990 rank | | | | 2015 rank |
|---|---|---|---|---|
| 155.77 | 1 Cardiovascular diseases | | 1 Neoplasms | 200.79 |
| 83.16 | 2 Neoplasms | | 2 Cardiovascular diseases | 199.19 |
| 66.07 | 3 Diarrhea/LRI/other | | 3 Diarrhea/LRI/other | 97.07 |
| 33.86 | 4 Diabetes/urog/blood/endo | | 4 Diabetes/urog/blood/endo | 92.96 |
| 30.98 | 5 Unintentional inj | | 5 Chronic respiratory | 44.76 |

- More than one third (36.3%) of men (age > 20) and half of women (54.9%) had uncontrolled hypertension (Aekplakorn et al., 2011)

- Hypertension continues to associate with morbidity and increased health care burden including stroke, chronic heart failure, renal insufficiency and myocardial infarction.

GBD Compare (http://viz.healthmetricsandevaluation.org/gbd-compare/), 2015

# Background
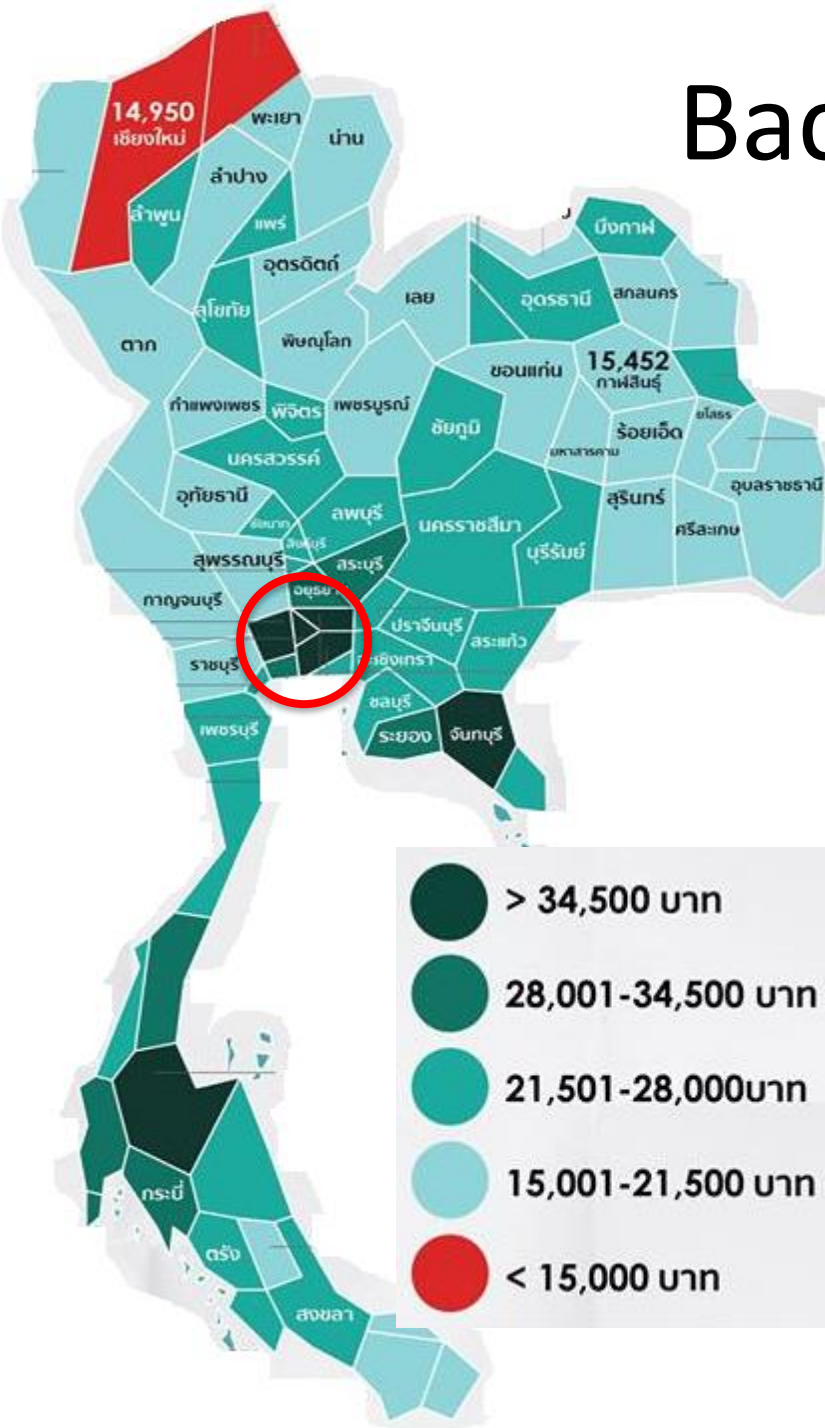


High quality treatment, modern clinical practice guidelines have been developed.

Accessibility to advanced treatment is limited to metropolitan areas and for high socioeconomic status patients

Nursing intervention have been studied and implemented

The interventions were focused on education to improved knowledge

# Person-centered and integrated health services model (PC-IHS)
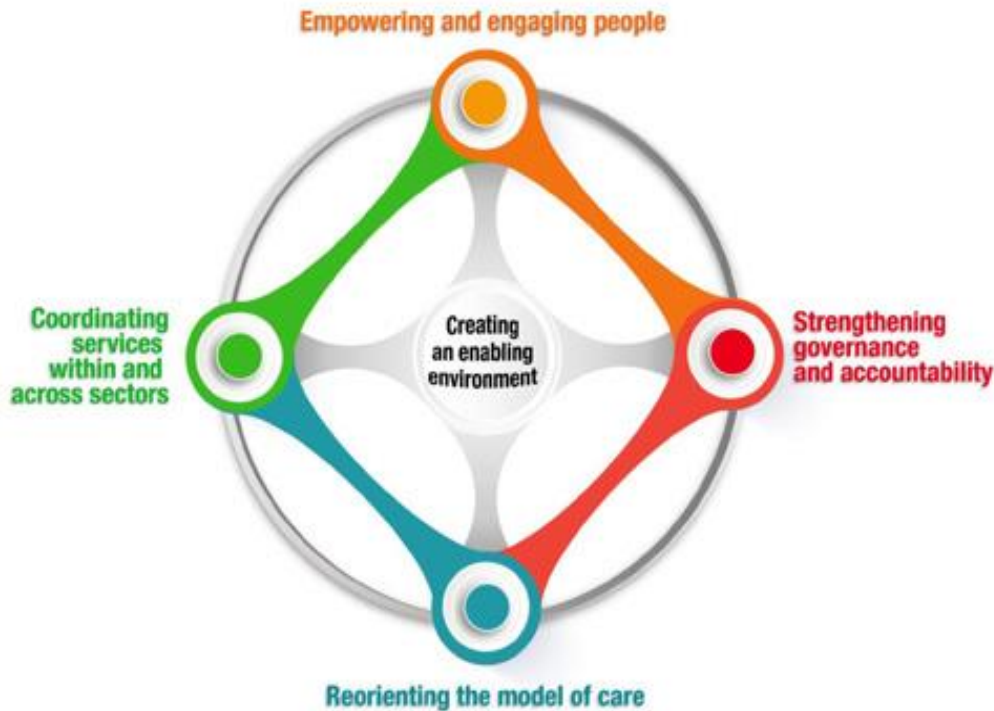


1. Engaging and empowering people and communities;

2. Strengthening governance and accountability;

3. Reorienting the model of care;

4. Coordinating services within and across sectors;

5. Creating an enabling environment.

# Intervention

1. Intervention groups were divided into ten sub-groups

- Self-observation, reflection and self-diagnostic information related to hypertension

2. Group activity for setting the personal goal to control high blood level and waist circumference and matching with close friend(s)

- Aim to increase the individual's understanding of emotional states, level of motivation, and performance about hypertension control

# Intervention

| Timeline | Activities |
| --- | --- |
| Week 1 | Self-observation |
| Week 2 | Judgment Process |
| Week 3-4 | Self-reactions |
| Week 5 | After participation data collection |
| Month 3 | After participation data collection |
| Month 6 | After participation data collection |

# Designs

- A cross-sectional data analysis of each time phase of the parent study "Community-based intervention to promote self-management for rural dwelling people with hypertension: mixed method study

# Setting

- Residents of 17 villages, and were users of the primary health care center in Nakhon Ratchasima Province, Thailand
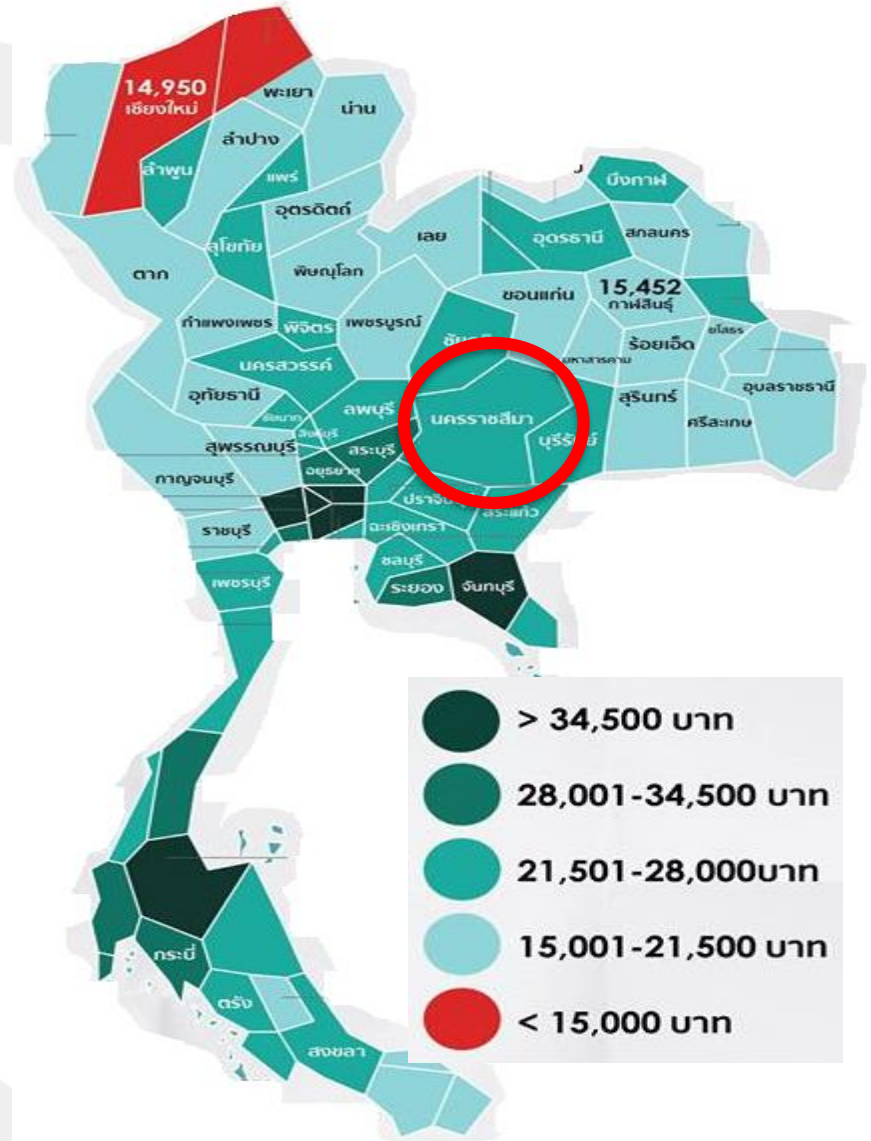
# Participants

- A sample of 156 elderly with hypertension, 70 years old on average and mostly female (68.5%).  77 (49.36%) participants attended a community-based intervention.

# Aim 1

- To predict the predictors of adherence at baseline, 1, 3, and 6 months in individuals with hypertension in rural Thailand.

| Weekly intervention |

Recruit Baseline — 1 month — 3 month — 6 month — 12 month

Multiple linear regression, model selection by stepwise selection
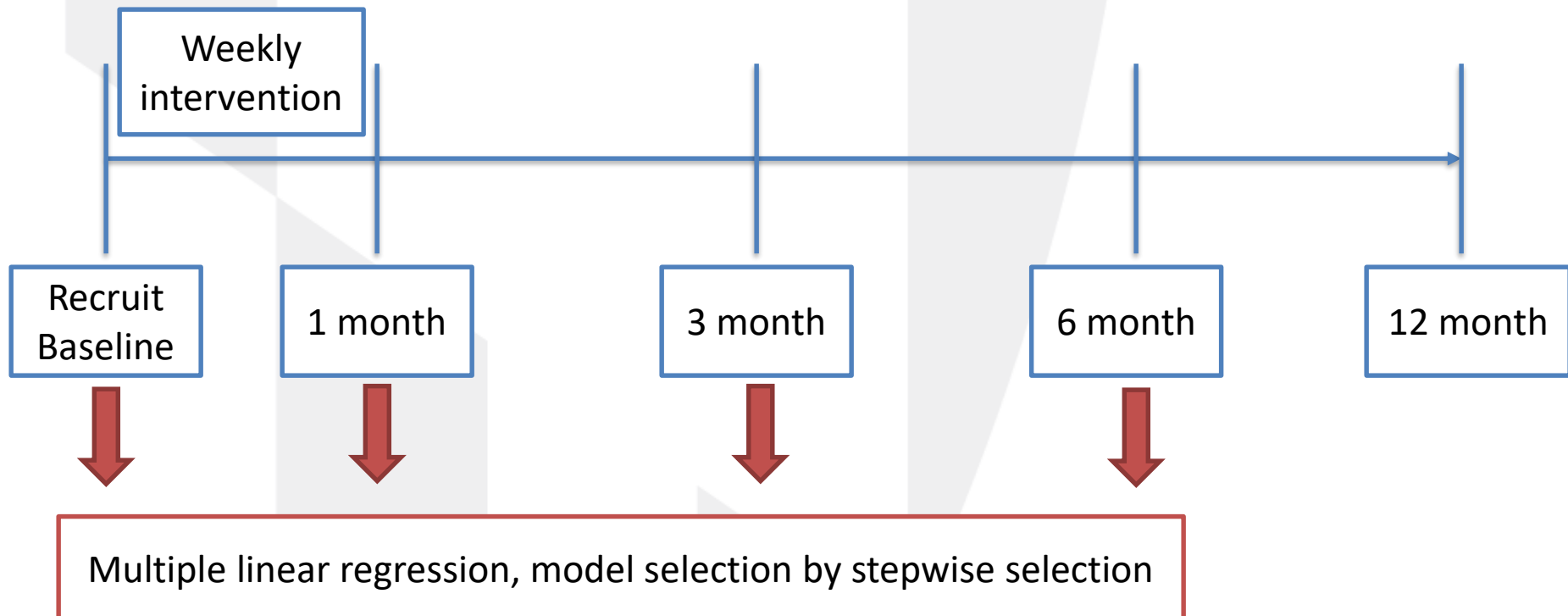
# Power analysis

- G*Power

- Multiple linear regression with up to 12 predictors

- 156 participants

- Significant level at 0.05

- Fixed model with $r^2$ deviation from zero

| Effect Size ($f^2$) | Power |
|---|---|
| 0.02 (small) | 0.15 |
| 0.15 (medium) | 0.89 |
| 0.35 (large) | 0.99 |

# Results

**Table 1.** Adjusted* coefficient of factors predicting adherence score

| | Baseline | | | 1 month | | | 3 month | | | 6 month | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | 95% CI | P value | Coef. | 95%CI | P value | Coef. | 95%CI | P value | Coef. | 95%CI | P value |
| Age - years | 0.04 | (-0.05,0.13) | 0.36 | -0.01 | (-0.08,0.06) | 0.78 | 0.03 | (-0.07,0.12) | 0.57 | 0.02 | (-0.06,0.10) | 0.65 |
| Group Intervention VS Control | 0.12 | (-0.98,1.22) | 0.83 | -0.27 | (-1.18,0.64) | 0.56 | -1.76 | (-2.92,-0.61) | 0.00 | -1.35 | (-2.39,-0.30) | 0.01 |
| Gender Female VS Male | -1.08 | (-2.27,0.11) | 0.08 | -0.36 | (-1.38,0.65) | 0.48 | -1.23 | (-2.47,0.01) | 0.05 | -0.27 | (-1.37,0.83) | 0.63 |
| Education Greater VS high school | -0.57 | (-1.81,0.67) | 0.37 | 1.18 | (0.14,2.21) | 0.03 | 0.86 | (-0.48,2.16) | 0.19 | 1.21 | (0.05,2.38) | 0.04 |
| SBP - mmHg | 0.01 | (-0.03,0.06) | 0.58 | -0.02 | (-0.04,0.01) | 0.18 | 0.00 | (-0.03,0.04) | 0.90 | 0.00 | (-0.03,0.04) | 0.96 |
| DBP - mmHg | 0.03 | (-0.02,0.08) | 0.27 | 0.03 | (-0.01,0.07) | 0.16 | -0.01 | (-0.06,0.05) | 0.82 | 0.04 | (-0.01,0.09) | 0.11 |
| WC - cm | 0.00 | (-0.05,0.05) | 0.93 | 0.00 | (-0.04,0.04) | 0.89 | 0.00 | (-0.06,0.05) | 0.85 | 0.02 | (-0.02,0.06) | 0.41 |
| Income Paid VS unpaid | 0.61 | (-1.43,2.64) | 0.56 | 0.09 | (-1.56,1.73) | 0.91 | 0.15 | (-1.94,2.24) | 0.88 | 0.65 | (-1.23,2.52) | 0.50 |
| Caregiver Yes VS No | -0.62 | (-1.96,0.71) | 0.36 | -0.29 | (-1.37,0.81) | 0.61 | 0.13 | (-1.26,1.53) | 0.85 | 0.00 | (-1.24,1.23) | 0.99 |
| Number of medication >2 VS ≤ 2 | 0.57 | (-0.80,1.94) | 0.41 | -0.27 | (-1.41,0.87) | 0.64 | -0.20 | (-1.63,1.25) | 0.79 | 0.46 | (-0.86,1.79) | 0.49 |
| Other comorbidity Yes VS No | -0.75 | (-2.11,0.61) | 0.28 | -1.03 | (-2.16,0.10) | 0.07 | -1.08 | (-2.50,0.33) | 0.13 | -1.23 | (-2.50,0.04) | 0.06 |
| Duration of Hypertension | -0.04 | (-.012,0.04) | 0.31 | 0.03 | (-0.04,0.10) | 0.38 | 0.01 | (-0.07,0.09) | 0.82 | 0.00 | (-0.07,0.07) | 0.99 |

*Adjusted model includes age, group, gender, education, SBP, DBP, WC, income, caregiver, number of medication, comorbidity and duration of hypertension.
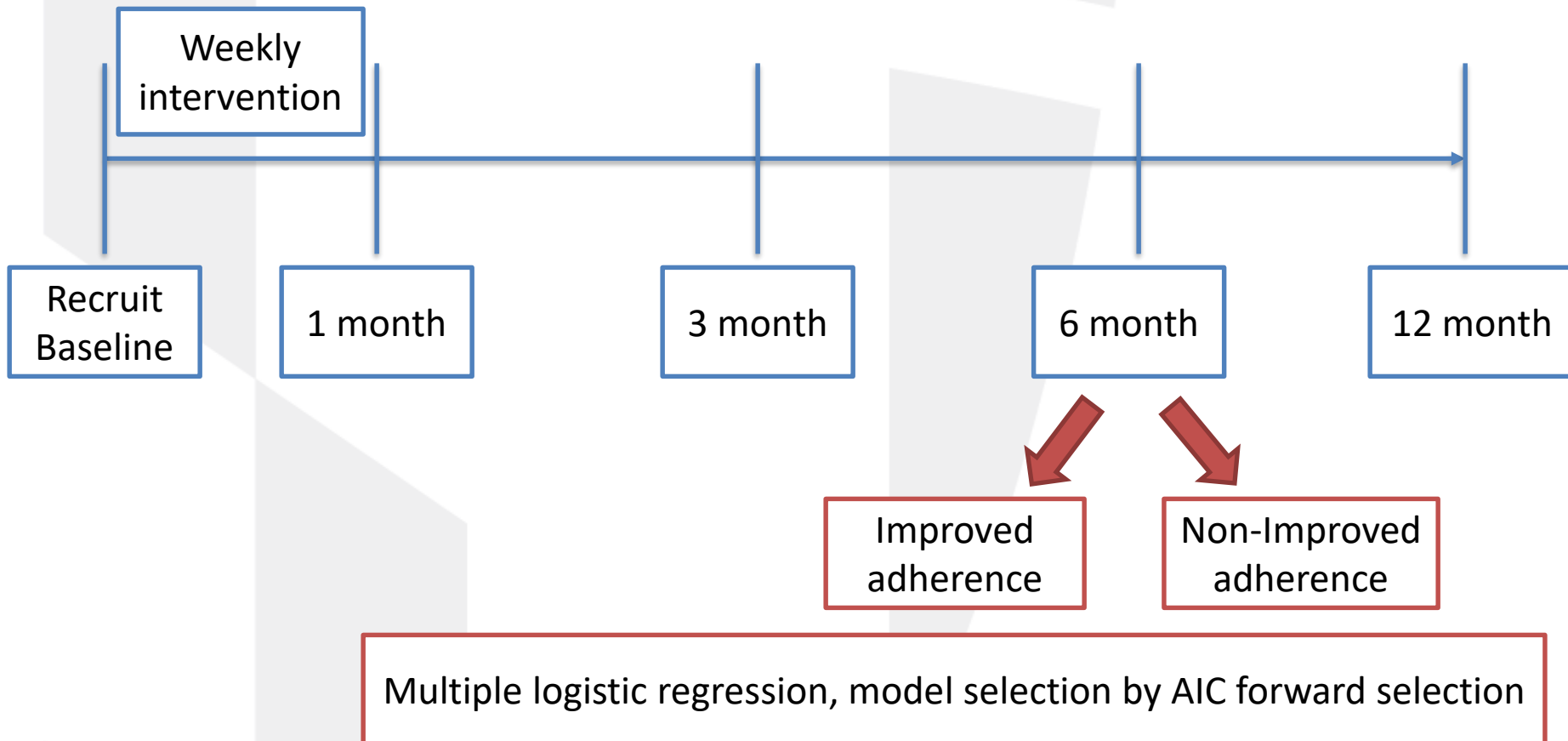
# Results

Intervention had lower mean score of adherence by 1.45 and 1.66 point comparing with control

Table 2 Final model of factors predicting adherence score by stepwise backward selection technique

| | Baseline | | | 1 month | | | 3 month | | | 6 month | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | 95% CI | P value | Coef. | 95%CI | P value | Coef. | 95%CI | P value | Coef. | 95%CI | P value |
| Group Intervention VS Control | | | | | | | -1.66 | (-2.71,-0.61) | 0.00 | -1.45 | (-2.42,.-0.47) | 0.00 |
| Gender Female VS Male | -1.11 | (-2.19,-0.03) | 0.05 | | | | -1.37 | (-2.50,-0.24) | 0.02 | | | |
| Education Greater VS high school | | | | 1.35 | (0.37,2.32) | 0.01 | | | | 1.30 | (0.19,2.41) | 0.02 |
| DBP - mmHg | | | | 0.03 | (-0.00,0.06) | 0.15 | | | | 0.04 | (-0.00,0.08) | 0.07 |
| Other comorbidity Yes VS No | -0.52 | (-1.10,0.04) | 0.07 | -1.06 | (-2.12,-0.00) | 0.05 | -0.93 | (-2.26,0.40) | 0.17 | -1.15 | (-2.33,0.03) | 0.06 |

# Aim 2

- To discuss factors influencing adherence status to an intervention at six months follow-up

Weekly intervention

Recruit Baseline

1 month

3 month

6 month

12 month

Improved adherence

Non-Improved adherence

Multiple logistic regression, model selection by AIC forward selection

# Power analysis

- G*Power

- Multiple logistic regression

- 156 participants

- Significant level at 0.05

- Prevalence of non-adherence to treatment is 30%

| Odds ratio | % N | | | | |
|---|---|---|---|---|---|
| | 10% | 20% | 30% | 40% | 50% |
| 1.5 | 0.33 | 0.51 | 0.61 | 0.66 | 0.68 |
| 1.7 | 0.51 | 0.73 | 0.82 | 0.87 | 0.88 |
| 2.0 | 0.74 | 0.92 | 0.96 | 0.97 | 0.98 |
| 2.1 | 0.80 | 0.95 | 0.98 | 0.99 | 0.99 |

# Results

**Table 4.** Crude and adjusted relative odds of improved adherence

| | Crude | | | Adjusted* | | |
|---|---|---|---|---|---|---|
| | RO | 95% CI | P value | RO | 95%CI | P value |
| Age - years | 1.00 | (0.96-1.05) | 0.87 | 0.99 | (0.94-1.05) | 0.86 |
| Group Intervention VS Control | 2.70 | (1.41-5.17) | 0.003 | 2.65 | (1.31-5.34) | 0.006 |
| Gender Female VS Male | 0.81 | (0.41-1.60) | 0.54 | 0.56 | (0.24-1.31) | 0.18 |
| Marital status | 3.06 | (0.98-9.48) | 0.05 | 3.14 | (0.84-11.77) | 0.09 |
| Single | 1.71 | (0.86-3.41) | 0.13 | 1.33 | (0.58-3.06) | 0.50 |
| Married | 1 | | | 1 | | |
| Used to have partner (Reference) | | | | | | |
| Education Greater VS high school and lower | 0.68 | (0.31-1.46) | 0.32 | 0.64 | (0.27-1.51) | 0.31 |
| Maintain or decrease SBP Yes VS No | 1.35 | (0.64-2.86) | 0.43 | 0.87 | (0.35-2.18) | 0.77 |
| Maintain or decrease DBP Yes VS No | 1.73 | (0.88-3.41) | 0.11 | 1.44 | (0.63-3.36) | 0.39 |
| Maintain or decrease WC Yes VS No | 1.74 | (0.92-3.31) | 0.09 | 1.85 | (0.91-3.77) | 0.09 |
| Caregiver Yes VS No | 0.95 | (0.43-2.10) | 0.91 | 1.36 | (0.46-4.00) | 0.58 |
| Number of medication | 1 | | | 1 | 1 | 1 |
| ≤ 2 (Reference) | 0.98 | (0.40-2.43) | 0.97 | 1.17 | (0.46-3.16) | 0.75 |
| 3-4 | 1.54 | (0.64-3.74) | 0.34 | 1.55 | (0.58-4.15) | 0.39 |
| ≥5 | | | | | | |
| Comorbidity ≥2 VS 1 and 0 | 1.13 | (0.60-2.14) | 0.70 | 0.96 | (0.46-1.99) | 0.920.64 |
| Duration of Hypertension | 1.00 | (0.96-1.05) | 0.80 | 1.00 | (0.95-1.05) | 0.90 |

*Adjusted model includes age, group, gender, marital status, education maintained of SBP, DBP, WC, caregiver, number of medication, comorbidity and duration of hypertension.

# Results

**Table 5.** Final model by AIC forward selection

|  | RO | 95% CI | P Value |
|---|---|---|---|
| Group<br>Intervention VS Control | 2.69 | (1.38-5.21) | 0.003 |
| Maintain or decrease WC<br>Yes VS No | 1.68 | (0.86-3.30) | 0.128 |
| Marital status<br>Single<br>Married<br>Used to have partner (Reference) | 2.90<br>1.71<br>1 | (0.89-9.48)<br>(0.84-3.51) | 0.078<br>0.142 |

LR chi2 (4) =15.98, P=0.003, AIC=209.87

# Discussion

- The program allowed participants to share their experiences with others and the researcher set goals to manage hypertension together, so they were engaged in an active process rather than passively accepting directives from a health professional.

# Thank You

## Questions, Comments, Remarks