

## The Relationship Between Family Support and Medication Adherence Among Employees with Hypertension in a Shipping Logistics Company

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### Abstract

**Introduction:** Hypertension is a major global health issue and ranks second among diseases at a shipping logistics company in Surabaya. Medication adherence is vital for preventing complications, yet evidence on family support remains inconsistent. **Objective:** This study examined the association between family support and medication adherence in hypertensive employees. **Methods:** A cross-sectional design with 84 purposively sampled hypertensive employees undergoing treatment was used. Data were collected via structured questionnaires on demographics, the Perceived Social Support from Family Scale, and the Hill-Bone Compliance Scale. Bivariate analysis used the Chi-square test. A family support intervention was piloted on five lowest-support respondents and evaluated with a paired t-test. **Results and Discussion:** Most participants were male, aged >50 years, and held a bachelor's degree. The majority reported strong family support and moderate adherence. A significant relationship was found ( $p < 0.05$ ); strong support correlated with >8-fold higher adherence likelihood. The intervention significantly increased support scores ( $p < 0.05$ ). **Conclusions:** Family support significantly associates with better medication adherence among hypertensive employees. Preliminary evidence suggests structured interventions can effectively enhance perceived family support.

## **The Relationship Between Family Support and Medication Adherence Among Employees with Hypertension in a Shipping Logistics Company**

### **Introduction**

Hypertension remains a leading global health challenge, affecting 1.28 billion adults worldwide, with disproportionate burden in low- and middle-income countries (Choudhry et al., 2022). In Indonesia, national surveys report a prevalence of 30.8% among adults, with East Java at 32.8% (Kementerian Kesehatan RI, 2023). Despite effective therapies, only 21% of hypertensive patients globally achieve optimal blood pressure control, primarily due to suboptimal medication adherence (World Health Organization, 2023). Non-adherence increases cardiovascular event risk and mortality by 50–80% (Burnier & Egan, 2019).

Among the working population, adherence becomes particularly challenging. Occupational factors—shift work, high-performance targets, demanding mobility schedules, and limited family interaction time—can disrupt medication routines. In a shipping logistics company in Surabaya, hypertension ranked as the second most common occupational illness in 2024, accounting for 16% of all reported diseases.

Family support has been identified as a potential facilitator of adherence through emotional encouragement, motivational reinforcement, and facilitating healthcare communication (Ojo et al., 2016). However, evidence remains inconsistent. While several studies report significant positive associations (Shahin et al., 2021; Togatorop, 2024; Nurannisa et al., 2022), others find no significant relationship, citing barriers such as low family health literacy, financial constraints, and forgetting (Xiong et al., 2023; Olaniran et al., 2023; Wu et al., 2024).

Beyond family support, adherence is influenced by multiple factors including number of medications, side effects, treatment duration, medication cost and access, disease knowledge, health perceptions, and patient-provider relationships. These confounding variables warrant consideration when examining the family support-adherence relationship. This study investigates the relationship between family support and medication adherence among hypertensive employees in a shipping logistics company in Surabaya, addressing a critical gap in occupational health research within Indonesia's maritime logistics sector.

### **Method**

This study employed a cross-sectional design with a subsequent pre-post intervention component. The cross-sectional phase involved data collection at a single time point using structured questionnaires to assess the relationship between family support and medication adherence among hypertensive employees. Following the cross-sectional data collection, a pre-post intervention was conducted on the five respondents with the lowest family support scores to evaluate the preliminary impact of a family support enhancement program on medication adherence. The study was conducted at a shipping logistics company in Surabaya, Indonesia, over a two-month period from October to November 2025.

The target population consisted of all employees diagnosed with hypertension at the shipping logistics company in Surabaya, defined as individuals who had received an official diagnosis of hypertension and had been prescribed antihypertensive medications by a healthcare professional. The minimum required sample size was calculated using the formula for unpaired categorical comparative analysis, yielding a total of 84 respondents (42 per group), based on a 5% significance level ( $Z\alpha = 1.96$ ), 80% power ( $Z\beta = 0.84$ ), with proportions of adherence set at 40% for the low support group and 70% for the high support group (Unger et al., 2020; Choudhry et al., 2022).

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Participants were selected using purposive sampling based on predetermined inclusion criteria—employees diagnosed with hypertension, aged  $\geq 18$  years, and willing to provide written informed consent—while exclusion criteria comprised employees with severely compromised health conditions, those experiencing difficulty comprehending questionnaire items, employees without family members, and those who had resigned from the company.

Data were collected through structured face-to-face interviews. The questionnaire comprised four main sections: general demographic information, blood pressure measurement, medication adherence assessment using the Hill-Bone Compliance to High Blood Pressure Therapy Scale, and family support assessment using the Perceived Social Support from Family (PSS-Fa) scale. Blood pressure was measured using a validated digital sphygmomanometer and classified as controlled if  $< 140/90$  mmHg and uncontrolled if  $\geq 140/90$  mmHg in accordance with the International Society of Hypertension 2020 guidelines (Unger et al., 2020). Medication adherence was assessed using the Hill-Bone Compliance Scale, a 14-item instrument encompassing medication-taking behavior, dietary adherence, and appointment-keeping, scored on a 4-point Likert scale, with total scores categorized as high adherence (14–20), moderate adherence (21–35), or low adherence (36–56) (Johns Hopkins School of Nursing, n.d.). Family support was measured using the PSS-Fa scale consisting of 20 items with three response options, yielding total scores categorized as no support ( $\leq 6$ ), weak support (7–10), or strong support ( $\geq 11$ ) (Priastana et al., 2018). Both instruments have been previously adapted and validated in Indonesian populations. An intervention was subsequently administered to the five respondents with the lowest family support scores, following the Rosland and Piette (2010) framework, comprising three sequential sessions: (1) education and goal-setting (30–45 minutes), (2) supportive and empathic communication training (20–30 minutes), and (3) a 7-day "15-Minute Family Time" home assignment.

All statistical analyses were performed using SPSS version 27. Descriptive statistics were used to summarize demographic characteristics, medication adherence levels, and family support categories, presented as frequencies and percentages. Bivariate analysis was conducted using the Chi-square test to examine the association between family support and medication adherence. The level of statistical significance was set at  $p < 0.05$ . For the intervention component, a paired sample t-test was used to compare pre- and post-intervention family support scores. This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki, with ethical approval obtained from the Ethics Committee of the Faculty of Medicine, Pelita Harapan University (approval letter reference number 282/K-LKJ/ETIK/X/2025).

## **Result and Discussion**

### **1. Result**

#### **Respondent Characteristics**

The majority were male (68 respondents, 81%), while female respondents comprised 16 individuals (19%). Age distribution was relatively balanced, with the largest proportion in the  $> 50$  years age group (31 respondents, 36.9%), followed by the  $< 40$  years group (29 respondents, 34.5%), and the 40–50 years group (24 respondents, 28.6%). Regarding educational attainment, the majority held a bachelor's degree (68 respondents, 81%), while those with senior high school and postgraduate education each accounted for 8 respondents (9.5%). Based on occupational position, most respondents worked as staff (55 respondents, 65.5%). The majority were married (72 respondents,

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85.7%). Concerning household composition, most respondents lived with 1–4 family members (67 respondents, 79.8%). Monthly income distribution was relatively balanced, with 44 respondents (52.4%) earning <Rp 10,000,000 and 40 respondents (47.6%) earning ≥Rp 10,000,000. Based on hypertension control status, more than half of respondents had controlled hypertension (47 respondents, 56%), while 37 respondents (44%) had uncontrolled hypertension.

### Distribution of Family Support Levels

More than half of respondents (46 respondents, 54.8%) reported strong family support. Respondents with weak family support numbered 24 (28.6%), while 14 respondents (16.7%) reported no family support. Analysis across the four dimensions of family support revealed that instrumental support ranked highest at 60.4%, followed by appraisal support (56.5%), informational support (49.1%), and emotional support (43.8%) as the lowest.

### Distribution of Medication Adherence Levels

The majority of respondents (56 respondents, 66.7%) demonstrated moderate adherence. Respondents with low adherence numbered 17 (20.2%), while those with high adherence comprised 11 respondents (13.1%).

### Distribution of Medication Adherence by Family Support Level

In the no family support group, the majority (71.4%) exhibited low adherence and none (0.0%) demonstrated high adherence. Conversely, in the strong family support group, only 6.5% had low adherence while 23.9% achieved high adherence.

### Relationship Between Family Support Level and Medication Adherence

For statistical analysis, categories were collapsed due to zero cells. Adherence was recategorized as "Non-Adherent" (low adherence) and "Adherent" (combining moderate and high adherence), based on the midpoint calculation of the Hill-Bone scale range (14–56), with a cut-off of 35 representing the boundary between incidental and habitual non-adherence (60,61). Family support was dichotomized as "Weak Support" (combining no support and weak support) and "Strong Support", based on the midpoint calculation of the PSS-Fa scale range (0–20), with a cut-off of 10 distinguishing weak from strong support (61). Table 1 demonstrates a significant association between family support and medication adherence ( $p = 0.001$ ). Strong family support was associated with higher medication adherence, with patients having weak family support exhibiting a more than 8.36-fold increased risk of non-adherence compared to those with strong family support (OR = 8.361; 95% CI: 2.182–32.035).

**Table 1**  
Relationship Between Family Support Level and Medication Adherence

| Family Support |                | Medication Adherence |              | OR    | P-value | 95% CI       |
|----------------|----------------|----------------------|--------------|-------|---------|--------------|
| Weak Support   | Strong Support | Non-Adherent (%)     | Adherent (%) |       |         |              |
|                |                | 14 (36.8)            | 24 (63.2)    | 8.361 | 0.001   | 2.182-32.035 |

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### Intervention Flow

A family support enhancement intervention was implemented for five respondents selected based on the lowest baseline family support scores. The intervention was conducted online by the researcher during the fourth week of November 2025, following a structured flow comprising three phases: coordination and scheduling, intervention implementation with reassessment, and outcome evaluation. The first phase involved communication with each respondent and their household family members to establish mutually agreeable intervention schedules outside working hours. Through negotiation and confirmation, individual online sessions were successfully scheduled for each family unit. The second phase comprised intervention delivery and post-intervention reassessment of family support using the PSS-Fa instrument, conducted one week following the intervention. The third phase involved statistical analysis using paired sample t-test to compare pre- and post-intervention family support scores from the same subjects.

### Intervention Implementation and Reassessment

The intervention consisted of three sessions: (1) Education and Goal Setting (30–45 minutes) using interactive presentations and group discussions, introducing the four types of family support and their roles in hypertension medication adherence, with each family formulating 2–3 specific support goals to implement at home; (2) Supportive and Empathic Communication Training (20–30 minutes) through role-play and simulation exercises, training families in active listening, paraphrasing, and formulating supportive statements that respect patient autonomy, resulting in improved empathic verbal responses; and (3) "15-Minute Family Time" Home Assignment conducted for seven consecutive days, requiring families to dedicate 15 minutes without distractions for casual conversation, health status inquiry, expressing appreciation, and reviewing support goals, using a daily checklist to document implementation, successfully establishing consistent positive interaction routines. Reassessment using the PSS-Fa instrument was conducted one-week post-intervention.

### Intervention Evaluation

All five respondents demonstrated notable improvements in family support scores following the intervention. The mean score increased from 3.4 pre-intervention to 8.2 post-intervention, representing a mean increase of 4.8 points. Paired sample t-test analysis revealed a statistically significant difference ( $t = -4.496$ ,  $p = 0.011$ ), indicating that the intervention was effective in achieving its intended objective of enhancing family support among respondents with the lowest baseline support levels.

**Table 2**

| Intervention Evaluation |                        |                         |        |         |
|-------------------------|------------------------|-------------------------|--------|---------|
| Respondent Code         | Pre Intervention Score | Post Intervention Score | t test | P-Value |
| IA                      | 3                      | 8                       | -4.496 | 0.011   |
| HS1                     | 3                      | 11                      |        |         |
| HP                      | 3                      | 9                       |        |         |
| NC                      | 4                      | 7                       |        |         |
| HS2                     | 4                      | 6                       |        |         |
| <b>Mean</b>             | <b>3.4</b>             | <b>8.2</b>              |        |         |



## **2. Discussion**

The primary finding of this study demonstrates a strong and statistically significant association between family support and medication adherence, with employees reporting weak family support having an 8.36-fold higher risk of non-adherence compared to those with strong support (OR = 8.361; 95% CI: 2.182–32.035;  $p = 0.001$ ), consistent with previous reports (Pan et al., 2021; Geleta et al., 2025; Olalemi et al., 2020). However, this relationship is potentially confounded by multiple factors that warrant careful consideration. The number of antihypertensive medications and polypharmacy may inflate the observed association, as patients on complex regimens require greater family assistance while simultaneously facing higher non-adherence risk due to increased pill burden and costs (Burnier & Egan, 2019). Similarly, medication side effects—including fatigue, dizziness, and cough—frequently drive intentional non-adherence (Bhagavathula et al., 2016); patients experiencing adverse effects may need more family support to sustain adherence, whereas those without side effects may adhere regardless of support levels, yet this study did not systematically assess side effect profiles. Duration of hypertension also introduces temporal confounding, as longer disease duration often correlates with both established family support networks and better adherence routines, while newly diagnosed patients may lack adequate support during treatment initiation (Kario et al., 2024).

Financial constraints represent another critical confounder (Olaniran et al., 2023); with 52.4% of respondents earning below Rp 10,000,000 monthly, medication affordability—though not directly assessed—may interact with family support, as higher socioeconomic status enables both greater material support and better medication access, potentially creating spurious associations between perceived support and adherence. Health literacy further complicates this relationship, as families with better hypertension knowledge provide more effective support while patients with greater disease understanding adhere better regardless of family involvement (Xiong et al., 2023). Illness perceptions and treatment beliefs, patient-provider relationship quality, and the presence of comorbidities similarly represent unmeasured confounders that may independently influence both family support and adherence behaviors (Costa & Nóbrega, 2008; Wu et al., 2024). The occupational characteristics of the shipping logistics sector—shift work, high-performance targets, demanding mobility schedules, and limited family interaction time—may independently reduce both support availability and medication adherence, representing a structural confounder rather than a direct causal pathway (Landsbergis et al., 2013). The finding that 85.7% of respondents were married and 79.8% lived with 1–4 family members further suggests that structural household composition, rather than functional support quality alone, may influence the observed relationship.

The intervention component demonstrated significant improvement in perceived family support (mean increase of 4.8 points;  $p = 0.011$ ), suggesting that even brief, structured programs can mobilize family resources effectively, consistent with prior short-term intervention studies (Bahtiar et al., 2025; Tielung & Budiawan, 2024). The "15-Minute Family Time" assignment proved particularly effective in establishing consistent positive interaction routines. However, the small sample size ( $n=5$ ) and absence of a control group limit causal attribution and generalizability. The finding that 16.7% of respondents reported no family support highlights employee vulnerability in this sector, reinforcing the need for workplace health programs that address both individual and family-level determinants of adherence. Family-based interventions align with Indonesian cultural values emphasizing collective responsibility (Kementerian

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Kesehatan RI, 2023), offering potentially scalable strategies for hypertension control in occupational settings. Several limitations warrant acknowledgment: the cross-sectional design precludes causal inference; self-reported measures are subject to social desirability and recall biases; the single-company sample limits generalizability; and multiple key confounders—including side effects, polypharmacy, health literacy, medication cost, comorbidities, provider relationships, and illness perceptions—were not systematically measured. Despite these limitations, the study offers valuable insights into an understudied occupational group, combining cross-sectional and intervention components to provide actionable evidence for designing targeted family-based adherence interventions in the maritime logistics workforce.

### **Conclusion**

This study demonstrates that family support is significantly associated with medication adherence among hypertensive employees in the shipping logistics sector, with employees receiving strong family support being 8.36 times more likely to be adherent compared to those with weak support. Although the majority of respondents (54.8%) reported strong family support, nearly half (45.2%) experienced insufficient support—ranging from weak (28.6%) to no support at all (16.7%)—while most employees (66.7%) demonstrated moderate adherence, with only 13.1% achieving high adherence and 20.2% remaining at low adherence levels. The brief, structured family support enhancement intervention successfully and significantly increased perceived family support scores from a mean of 3.4 to 8.2 (mean increase of +4.8 points;  $p = 0.011$ ), yielding a standardized intervention protocol that can be replicated across various community and occupational settings.

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