



Training and Assistance in Utilizing Huma for Fitness and Health for the Outer Baduy Community, Ciboleger

Dena Widyawan^{1*}, Mochamad Derry Prasaja², Rizki khoirul Yakin³,
Sul Abidin⁴, Weny Widyawati Bastaman⁵

¹ Universitas Negeri Jakarta, Jakarta Indonesia

^{2, 3, 4, 5} Universitas Setia Budhi Rangkasbitung, Indonesia

Corresponding author: dena_widyawan@unj.ac.id

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ABSTRAK

Masyarakat Baduy Luar di Ciboleger menghadapi peningkatan risiko penyakit degeneratif akibat perubahan pola hidup dan kurangnya aktivitas fisik terstruktur. Huma, rumah panggung tradisional mereka, memiliki potensi sebagai sarana latihan kebugaran yang belum dimanfaatkan. Kegiatan pengabdian ini bertujuan meningkatkan pengetahuan, keterampilan, dan kebugaran warga melalui pelatihan dan pendampingan pemanfaatan struktur huma untuk latihan fisik. Metode meliputi penyuluhan kesehatan, pelatihan teknik senam huma berbasis beban tubuh, demonstrasi, serta pendampingan kelompok selama dua bulan. Evaluasi dilakukan melalui kuesioner pengetahuan, tes kebugaran (fleksibilitas, daya tahan kardiorespirasi, kekuatan genggam), dan observasi. Hasil menunjukkan peningkatan signifikan pengetahuan (dari rata-rata 45,3 menjadi 85,7) dan seluruh komponen kebugaran ($p < 0,05$). Terbentuk tiga kelompok senam huma yang rutin berlatih. Warga merasakan penurunan keluhan nyeri punggung dan peningkatan stamina. Kesimpulannya, pelatihan berbasis kearifan lokal efektif dan berkelanjutan untuk meningkatkan derajat kesehatan masyarakat adat.

Kata kunci: Huma; Kebugaran; Baduy Luar; Pelatihan; Kearifan Lokal.

ABSTRACT

The Outer Baduy community in Ciboleger faces an increasing risk of degenerative diseases due to changing lifestyles and lack of structured physical activity. The huma, their traditional stilt house, holds untapped potential as a fitness training tool. This community service activity aims to improve the knowledge, skills, and physical fitness of residents through training and assistance in utilizing the huma structure for exercise. Methods included health education, training in bodyweight-based huma exercise techniques, demonstrations, and group mentoring for two months. Evaluation was carried out through knowledge questionnaires, fitness tests (flexibility, cardiorespiratory endurance, handgrip strength), and observation. Results showed significant improvements in knowledge (from an average of 45.3 to 85.7) and all fitness components ($p < 0.05$). Three huma exercise groups were formed and are actively training. Residents reported reduced back pain complaints and increased stamina. In conclusion, locally-wisdom-based training is effective and sustainable for improving the health status of indigenous communities.

Keywords: Huma; Fitness; Outer Baduy; Training; Local Wisdom.

INTRODUCTION

The Outer Baduy community residing in Ciboleger Hamlet, Kanekes Village, Lebak Regency, Banten, is an indigenous community that has gradually opened itself to interaction with the outside world. The population of this area is around 1,200 people, with livelihoods primarily in farming and gardening. Although the agrarian lifestyle demands physical activity, observations indicate that most of these activities are monotonous and do not comprehensively cover fitness components. Over the past decade, the introduction of roads, motorized vehicles, and processed food consumption has begun to alter the residents' activity patterns and dietary habits. This shift has triggered the emergence of non-communicable disease (NCD) risk factors such as hypertension, diabetes mellitus, and central obesity in the adult population (Neng yulia maudi et al., 2021; Umam, 2021).

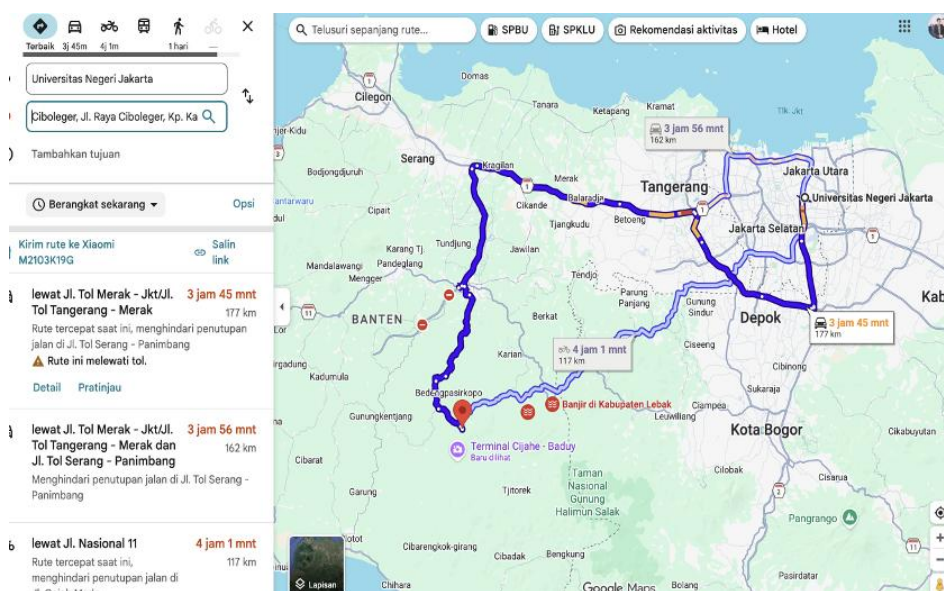


Figure 1. Geographical location of partners and Universitas Negeri Jakarta

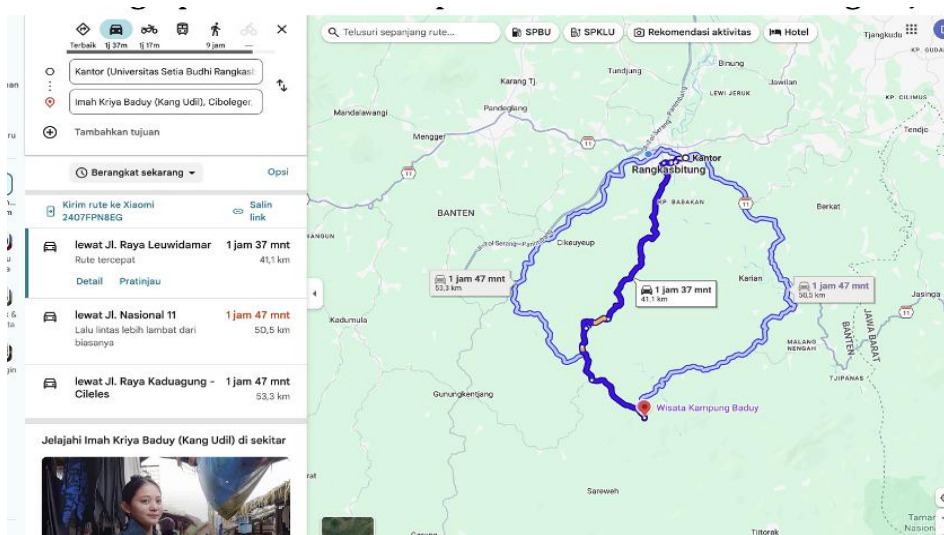


Figure 2. Geographical location of partners and Universitas Setia Budhi Rangsasbitung

The huma is a traditional Baduy stilt house constructed from bamboo and wood, supported by pillars 1–1.5 meters high, complete with stairs, crossbeams, and railings. This structure naturally provides various movement possibilities: ascending and descending the stairs trains leg muscles and cardiorespiratory fitness, holding onto the railings enables pulling and hanging exercises, and the beams serve as supports for balance training. However, until now, the huma has been viewed merely as a dwelling, not as a medium for improving fitness. This great potential has never been raised in any local community health empowerment program (Sopyan et al., 2023; Zhang et al., 2024).

The partners' problems show that residents' knowledge of physical fitness concepts and their relationship to health is still low. An initial survey of 40 adult residents showed that 72% did not know that structured physical activity is important for preventing NCDs, and 85% had never participated in a fitness training program. Musculoskeletal complaints such as lower back pain and knee pain were reported by 47% of respondents, conditions generally exacerbated by non-ergonomic work postures and a lack of strengthening exercises (Fouad et al., 2024; Prastiawan & Anjasmara, 2024). On the other hand, residents do not have access to modern fitness facilities due to geographical location and cultural values that restrict the construction of sports infrastructure.

More specifically, the priority problems faced by the partners are: (1) low health and fitness literacy; (2) the absence of a contextual, inexpensive, and culturally appropriate physical exercise model; (3) the high burden of musculoskeletal complaints; and (4) the lack of local asset-based empowerment initiatives capable of creating health self-sufficiency. Without appropriate intervention, this condition is feared to increase the burden of NCDs and decrease residents' productivity in the long term (Hara et al., 2025; Imamura et al., 2021; Kumar et al., 2025).

Based on this situation analysis, an empowerment model that integrates modern health knowledge with local wisdom is needed. The huma as a daily traditional house can become a "natural gym" that facilitates functional movements such as squats, step-ups, incline push-ups, hanging, and balancing. This approach aligns with the concept of eco-bio-cultural health, which emphasizes the importance of environmental and cultural context in indigenous community health promotion (Chong et al., 2024; Rooney et al., 2023; White et al., 2021). Training and assistance are key so that residents not only understand but are also capable and willing to independently apply huma exercises sustainably.

The objectives of this community service activity are: (1) to improve Outer Baduy residents' knowledge of the importance of physical fitness for health; (2) to train skills in performing a series of fitness exercises based on the huma structure; (3) to assist in establishing sustainable huma exercise groups; and (4) to measure the program's impact on improving fitness components and reducing musculoskeletal complaints. By achieving these objectives, it is expected that an applicable, easily replicable, and culturally respectful health empowerment model will be created.

IMPLEMENTATION METHOD

The community service activity was carried out over four months (August–November 2025) in Ciboleger Hamlet, involving 40 adult residents aged 25–60 years. The methods used combined several approaches: community education, science and technology diffusion, training, and mentoring. The first stage was coordination with traditional leaders (Jaro, Puun) and village officials to obtain permission, align perceptions, and arrange a schedule that did not interfere with the agricultural cycle. The second stage was health education on the theme “Fitness and Disease Prevention” using posters in the Sundanese Baduy dialect, with material delivered interactively and participatively.

The third stage was training and demonstration of huma exercises. The implementation team, together with a sports instructor, designed 10 basic movements utilizing parts of the huma: (1) step-up on stairs for cardio, (2) squat using a pillar for support, (3) incline push-up on the railing, (4) hanging hold on the upper bar, (5) hanging leg raise, (6) balance walk on the floor beam, (7) calf raises on the edge of the stairs, (8) standing trunk rotation assisted by a pillar, (9) shoulder stretch at the railing, and (10) cool-down breathing. Each movement was demonstrated, then practiced by all participants in small groups accompanied by facilitators. The entire training session lasted two full days.

The fourth stage was ongoing assistance. Participants were divided into three huma exercise groups based on the proximity of their houses, each accompanied by a local cadre who had been specially trained beforehand. Each group was asked to practice at least three times a week for 30 minutes. The service team conducted field visits every two weeks to monitor compliance, correct techniques, and provide motivation. In the third month, groups were encouraged to arrange independent training schedules and begin recording attendance and health complaints in a simple monitoring book.



Figure 3. Activity Implementation Stage

Evaluations were carried out quantitatively and qualitatively. Knowledge was assessed using a 20-item questionnaire administered before and after education (pre-test and post-test). Fitness levels were measured using three valid and practical instruments: sit and reach (flexibility), 2-minute step test (cardiorespiratory endurance) (Lemmink et al., 2003), and a handgrip dynamometer (hand muscle strength). Fitness measurements were taken before training (baseline) and after three months of assistance. Data analysis used paired t-tests at a significance level of 0.05.

Qualitative data were collected through in-depth interviews and focus group discussions (FGD) with participants and traditional leaders, then analysed thematically.

ACTIVITY RESULTS AND DISCUSSION

A total of 40 participants successfully completed all series of activities. Participant characteristics comprised 22 males (55%) and 18 females (45%), with an age range of 28–58 years (mean 42.3 years). The majority worked as farmers (82.5%), and the last educational level was mostly elementary school (72.5%). No participant dropped out of the assistance program, indicating high acceptance of activities based on their own culture.

The increase in knowledge was highly significant. The average pre-test score of 45.3 (SD 8.6) increased to 85.7 (SD 6.2) on the post-test, with $p < 0.001$. Before education, only 30% of participants could give an example of cardio exercise, and less than 20% understood the relationship between physical activity and blood pressure. After education, almost all participants (95%) were able to explain the benefits of human exercises and distinguish between types of strength, flexibility, and endurance exercises. This change shows that participatory education methods using contextual language and examples are highly effective for communities with limited formal literacy (Sukirman, 2017; Nasution, 2017). Complete data are presented in Table 1.

Table 1. Improvement in Participants' Knowledge Before and After Education

Knowledge Component	Pre-test (Mean $\pm$ SD)	Post-test (Mean $\pm$ SD)	p-value
Concept of fitness	42.1 $\pm$ 9.2	88.3 $\pm$ 5.8	<0.001
Benefits of exercise	48.5 $\pm$ 10.1	83.1 $\pm$ 7.3	<0.001
Overall average	45.3 $\pm$ 8.6	85.7 $\pm$ 6.2	<0.001

The participants' movement skills also improved markedly. On the first day of training, about 60% of participants had difficulty performing the balance walk and hanging hold movements. Through repeated demonstration and direct correction, by the end of training all participants were declared capable of performing all 10 movements with correct technique. Periodic assistance ensured high skill retention; observations at week 8 showed that 92.5% of participants were still practicing the movement series according to standards, both independently and in groups.

Fitness measurement results showed meaningful improvements in all three components (Table 2). Flexibility measured by sit and reach increased by an average of 4.8 cm ($p < 0.01$), indicating a reduction in stiffness of the lower back and hamstring muscles. Cardiorespiratory endurance through the 2-minute step test rose from an average of 68.4 steps to 82.1 steps ($p < 0.001$), equivalent to an increase in aerobic capacity. Right-hand grip strength increased from 28.6 kg to 31.2 kg ($p < 0.05$). These improvements are consistent with research showing that bodyweight training performed regularly in a natural environment can improve fitness parameters within 8–12 weeks (Hermawan et al., 2024; Mohd Roslan & Mokhtar, 2020; Singh et al., 2022).

Table 2. Changes in Fitness Parameters Before and After Assistance

Parameter	Baseline (Mean ± SD)	After 3 Months (Mean ± SD)	p-value
Flexibility (cm)	19.2 ± 6.5	24.0 ± 5.8	<0.01
2-min step (steps)	68.4 ± 11.2	82.1 ± 9.7	<0.001
Handgrip strength (kg)	28.6 ± 7.3	31.2 ± 6.9	<0.05

The most prominent subjective impact was a reduction in lower back pain complaints. In the FGD during the third month, 24 of the 30 participants who initially reported back pain stated that the frequency and intensity of pain had drastically decreased. A participant (female, 52 years old) stated, “Tadina sok nyeri pisan tonggong mun lila di huma, ayeuna mah tos jarang, badan oge janten ringan” (I used to have a very sore back if I stayed long in the house, now it’s rare, and my body feels lighter). Similar experiences were shared by many participants, who also reported increased stamina when working in the fields and ease in going up and down the huma stairs. This finding is in line with the benefits of core strengthening and stretching exercises that mechanically reduce the load on the spine (Çerezci-Duygu et al., 2025; Hlaing et al., 2021).

The sustainability of the program is evident from the formation of three huma exercise groups that independently schedule training twice a week in the yard of alternating houses. The trained local cadres lead the training sessions using movement guide posters installed at the hamlet hall. Support from traditional leaders was very strong; the Jaro of Ciboleger instructed that this activity be incorporated into the hamlet’s monthly activities. This confirms that programs aligned with cultural values and assets have a much greater chance of sustainability compared to programs brought from outside (Halmahera et al., 2019; Murdiana et al., 2021).

Further discussion shows that the use of the huma as an exercise platform not only improves fitness but also strengthens cultural identity and social cohesion. The community feels proud because their traditional house is recognized as having health value. The collective learning process in groups creates social support that strengthens intrinsic motivation to continue exercising. This perspective aligns with the community-based participatory research approach that positions the community as active subjects of health development, not merely as objects of program recipients (Cooper et al., 2022; Huse, 2020).



Figure 4. A participant practicing the incline push-up movement using the huma railing during training.



Figure 5. Community service team with Huma background in Baduy



Figure 6. Community service team with the Baduy Gate as a backdrop

CONCLUSION AND RECOMMENDATIONS

The training and assistance program utilizing the huma succeeded in significantly improving the knowledge, skills, and fitness components of the Outer Baduy community. Knowledge of fitness soared from an average score of 45.3 to 85.7. The skills for the 10 huma exercise movements were mastered by all participants and maintained through independent groups. Flexibility, cardiorespiratory endurance, and handgrip strength significantly improved after three months of intervention, accompanied by a reduction in back pain complaints. The establishment of three self-sustaining huma exercise groups confirms that this local wisdom-based intervention model is effective and sustainable. It is recommended that the village government and local health office integrate huma exercise into posyandu (integrated health post) and hamlet activities and provide support with simple fitness measurement tools. For universities, this activity can serve as a model for similar community service in other indigenous communities by adapting to each local asset.

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