



Motor Stimulation Training Through Family-Based Early Intervention to Enhance Early Childhood Development

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ABSTRACT

Early childhood represents a critical developmental period during which appropriate stimulation significantly influences children's future physical, cognitive, language, social, and emotional development. However, many parents continue to experience limited knowledge and practical skills in providing age-appropriate motor stimulation at home. This community service program aimed to improve parents' knowledge and practical competencies through motor stimulation training using a family-based early intervention approach. The program was implemented among parents of young children in Jember, East Java, using an empowerment model consisting of preparation, participant needs assessment, educational sessions, demonstrations, hands-on practice, discussions, mentoring, and program evaluation. The training emphasized gross and fine motor stimulation techniques that could be integrated into everyday family routines using inexpensive and locally available materials. Interactive learning methods enabled participants to observe, practice, and receive direct feedback regarding appropriate stimulation strategies. Program evaluation was conducted through observations, questionnaires, reflective discussions, and participant interviews. The implementation demonstrated increased parental understanding of child motor development, improved practical skills in conducting home-based stimulation, and stronger awareness of the importance of family involvement in early intervention. Participants expressed positive perceptions regarding the relevance, practicality, and applicability of the training materials within their daily parenting activities. The program also strengthened collaboration between higher education institutions and community stakeholders in promoting sustainable child development initiatives. Overall, family-based motor stimulation training proved to be an effective community empowerment strategy for enhancing parental competence and supporting optimal early childhood motor development.

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INTRODUCTION

Early childhood is widely recognized as the most critical developmental period throughout the human lifespan. During the first years of life, rapid neurological maturation creates substantial opportunities for developing cognitive, motor, language, emotional, and social competencies that form the basis of lifelong learning and overall well-being. Development occurring during this stage is highly sensitive to environmental influences, particularly the quality of stimulation provided by parents and other primary caregivers [1]. Consequently, early childhood is frequently referred to as the "golden age" because experiences during this period substantially determine children's future developmental trajectories [2].

Motor development constitutes one of the most fundamental developmental domains because it enables children to explore their environment, interact with surrounding objects, and participate actively in learning experiences [3]. Gross motor abilities—including walking, running, jumping, balancing, and climbing—support children's physical independence, while fine motor skills facilitate writing, drawing, manipulating objects, and performing daily self-care activities. Previous studies consistently demonstrate that children possessing stronger motor competence also exhibit higher academic readiness, better cognitive performance, healthier lifestyles, and improved psychosocial adjustment [4].

Despite its importance, delays in motor development remain common among young children worldwide. The World Health Organization reports that millions of children fail to achieve their developmental potential because they receive insufficient environmental stimulation during early childhood [5]. Limited developmental opportunities often originate not only from biological conditions but also from inadequate parental knowledge regarding child development, inappropriate parenting practices, and insufficient opportunities for meaningful physical play at home [6].

Parents constitute children's primary developmental environment. According to Bronfenbrenner's Ecological Systems Theory, the family represents the child's microsystem, exerting the strongest and most direct influence on developmental outcomes [7]. Daily parent-child interactions provide continuous learning experiences through communication, play, caregiving, and routine household activities. Consequently, strengthening parents' competencies represents one of the most effective strategies for promoting healthy child development [8].

Recent developments in early childhood intervention increasingly emphasize family-centered practices rather than professional-centered services. Family-based early intervention recognizes parents as active partners rather than passive recipients

of professional services. This approach empowers families to integrate developmental stimulation naturally into everyday routines, thereby creating sustainable learning opportunities beyond formal intervention sessions [9]. Research consistently indicates that family-centered intervention enhances parental confidence, increases developmental stimulation frequency, improves parent-child relationships, and contributes to better developmental outcomes among young children.

Nevertheless, observations conducted prior to this community service program revealed that many parents still experienced uncertainty regarding age-appropriate motor stimulation techniques. Most participants reported relying primarily on informal experiences rather than evidence-based developmental knowledge. Furthermore, parents frequently assumed that children's motor abilities would develop naturally without systematic stimulation, resulting in inconsistent developmental support at home [10].

Addressing these challenges requires educational programs that not only increase parents' theoretical understanding but also strengthen their practical competencies through demonstrations, guided practice, mentoring, and continuous feedback. Community empowerment through parent training represents an effective strategy because it enables families to independently support children's development using simple activities and readily available household materials. Such programs also encourage sustainable behavioral changes rather than temporary knowledge acquisition [11].

Based on these considerations, the Special Education Study Program of Universitas PGRI Argopuro Jember implemented a community service program entitled **"Motor Stimulation Training Through Family-Based Early Intervention for Young Children."** The program integrates evidence-based early intervention principles with family empowerment strategies to improve parents' abilities to conduct gross and fine motor stimulation within daily family routines.

The novelty of this community service activity lies in integrating family-centered early intervention principles, practical motor stimulation training, and community empowerment into a comprehensive educational model specifically designed for Indonesian families. Unlike conventional parenting seminars that predominantly emphasize theoretical knowledge, this program combines lectures, demonstrations, guided practice, mentoring, discussions, and follow-up evaluation to facilitate sustainable implementation within participants' natural home environments.

Therefore, this community service program aims to enhance parents' knowledge and practical skills regarding motor stimulation, strengthen family participation in

early childhood development, and establish sustainable collaboration between universities and community stakeholders in supporting optimal child development.

METHOD

This community service program employed a participatory community empowerment approach using a family-based early intervention model to improve parents' knowledge and practical skills in providing motor stimulation for young children. The intervention emphasized strengthening family capacity because parents are the primary agents responsible for supporting children's development within their natural environments. The implementation combined educational activities, practical demonstrations, guided practice, mentoring, and evaluation to facilitate sustainable learning and behavioral changes among participants.

The program was conducted in Jember, East Java, Indonesia, involving parents of young children as the primary participants. Supporting stakeholders included Early Childhood Education (PAUD) teachers, Posyandu cadres, community health workers, and representatives of the local village government. These stakeholders collaborated with the community service team to facilitate participant recruitment, organize program implementation, and strengthen the sustainability of the intervention after the completion of the training activities. The program was implemented over one community service period according to the schedule agreed upon by the university and community partners.

The first stage consisted of program preparation and coordination. The implementation team conducted meetings with community partners to determine the implementation schedule, identify participant characteristics, prepare the training venue, and organize facilities and logistical support. During this phase, educational materials, participant modules, observation sheets, questionnaires, attendance forms, and instructional media were prepared.

Prior to implementation, a preliminary needs assessment was conducted through direct observation and informal discussions with community representatives. The assessment revealed that many parents had limited understanding of age-appropriate motor development, early intervention principles, and effective stimulation techniques that could be implemented at home. These findings served as the basis for developing the educational content and selecting practical activities that addressed participants' actual needs.

The educational sessions aimed to provide participants with fundamental knowledge regarding early childhood motor development and family-based early intervention. Learning materials included child growth and development, gross motor

and fine motor milestones, developmental risk factors, the importance of early intervention, family-centered practices, and the role of parents in promoting children's development through everyday activities.

The educational sessions were delivered using interactive lectures, multimedia presentations, group discussions, and question-and-answer activities. Participants were encouraged to actively share their parenting experiences, discuss developmental concerns, and exchange ideas regarding strategies for supporting children's motor development within the family environment. This participatory learning approach enabled facilitators to adapt the discussion according to participants' educational backgrounds and practical needs.

Following the educational sessions, participants attended practical training focusing on motor stimulation activities suitable for young children. Facilitators first demonstrated each activity before participants practiced the techniques under direct supervision.

Gross motor stimulation activities included balance exercises, walking along straight lines, jumping over simple obstacles, throwing and catching balls, crawling, body coordination exercises, and movement games designed to improve balance, muscular strength, coordination, and spatial awareness.

Fine motor stimulation activities included stacking blocks, threading beads, folding paper, drawing, coloring, cutting with child-safe scissors, arranging puzzles, manipulating small objects, and hand-eye coordination exercises. The facilitators emphasized that all activities could be implemented using inexpensive household materials that were easily available within the family environment.

Participants practiced each activity individually and in small groups while receiving immediate feedback regarding movement techniques, child safety, communication strategies, and activity modification according to children's developmental levels. This guided practice enabled participants to acquire practical competencies that could be directly applied after returning home.

After completing the practical sessions, participants engaged in mentoring and consultation activities. Facilitators provided individualized guidance to address parenting challenges encountered by participants when supporting children's development. Discussions focused on integrating motor stimulation into daily family routines such as playing, eating, dressing, bathing, and household activities.

Participants also reflected on their learning experiences and collaboratively identified practical solutions for maintaining consistent developmental stimulation at home. This mentoring process strengthened participants' confidence and encouraged

sustainable implementation of family-based early intervention strategies beyond the duration of the training program.

Program evaluation was conducted at the conclusion of the community service activities to assess both implementation quality and participant outcomes. Evaluation employed descriptive methods using observations, questionnaires, reflective discussions, and brief semi-structured interviews.

Observation sheets were used to document participant attendance, engagement, participation during discussions, and practical performance throughout the training sessions. Questionnaires measured participants' perceptions regarding the relevance of training materials, clarity of instruction, usefulness of practical demonstrations, applicability of motor stimulation activities, and overall satisfaction with the program.

Reflective discussions and interviews were conducted to obtain qualitative information regarding participants' learning experiences, perceived benefits, implementation challenges, and recommendations for future community service activities. These qualitative findings complemented the observational data and provided a comprehensive understanding of participant responses toward the intervention.

The evaluation results were analyzed descriptively to identify improvements in participants' knowledge, confidence, and practical skills in implementing family-based motor stimulation. The findings also served as the basis for developing recommendations to improve future community service programs and strengthen sustainable collaboration between the university and community stakeholders.

The implementation utilized educational modules, presentation slides, developmental milestone charts, participant worksheets, observation forms, questionnaires, and various simple learning materials used during practical sessions. Gross motor activities employed cones, balance lines, soft balls, hoops, and simple obstacle equipment, whereas fine motor activities utilized paper, crayons, colored pencils, child-safe scissors, building blocks, beads, puzzles, ropes, and other inexpensive household materials. The use of locally available materials ensured that participants could independently replicate all stimulation activities within their homes without requiring specialized equipment.

The implementation process followed a sequential workflow consisting of: Coordination with community partners → Participant needs assessment → Preparation of educational materials → Educational sessions → Demonstration of motor stimulation → Guided practical training → Mentoring and consultation →

Program evaluation → Follow-up recommendations for sustainable family-based intervention.

This systematic implementation ensured that participants not only acquired theoretical knowledge but also developed practical competencies and confidence necessary for independently supporting their children's motor development within their daily family routines.

RESULT AND DISCUSSION

Result

The community service program entitled "**Motor Stimulation Training through Family-Based Early Intervention for Young Children**" was successfully implemented according to the planned schedule and implementation procedures. The activities involved parents of young children as the primary participants and were supported by Early Childhood Education (PAUD) institutions, Posyandu cadres, community health workers, and local government representatives. Throughout the implementation process, participants demonstrated high enthusiasm and actively participated in every stage of the training program.

The initial stage focused on participant preparation and needs assessment. Observations and discussions conducted before the educational sessions revealed that many parents possessed limited knowledge regarding developmental milestones, early intervention principles, and appropriate motor stimulation strategies for young children. Most participants reported relying on personal experience rather than evidence-based developmental knowledge when supporting their children's motor development. These findings confirmed the importance of providing systematic educational intervention to strengthen parental competence.

The educational sessions were delivered through interactive lectures supported by multimedia presentations and guided discussions. The materials covered child growth and development, gross and fine motor development, developmental milestones according to age, family-centered early intervention, and practical approaches to integrating developmental stimulation into everyday family routines. Participants actively engaged in discussions by sharing parenting experiences and asking questions regarding developmental problems commonly encountered at home. The interactive learning atmosphere facilitated meaningful exchanges between facilitators and participants, enabling parents to better understand their role in supporting child development.

The practical training sessions became the central component of the community service program. Facilitators demonstrated various gross motor stimulation activities,

including balance exercises, walking along straight lines, jumping, crawling, throwing and catching balls, and movement coordination games. Participants subsequently practiced each activity under direct supervision while receiving constructive feedback regarding proper techniques, child safety, and activity modifications appropriate for different developmental levels.

Fine motor stimulation activities included stacking blocks, threading beads, folding paper, coloring, drawing, cutting using child-safe scissors, arranging puzzles, and manipulating small objects. Participants demonstrated increasing confidence throughout the practical sessions and gradually became more capable of selecting stimulation activities appropriate to their children's developmental characteristics. The use of simple household materials enhanced participants' confidence because they recognized that effective developmental stimulation could be implemented without purchasing specialized educational equipment.

Mentoring and consultation sessions provided opportunities for participants to discuss practical challenges encountered in their family environments. Facilitators encouraged parents to integrate motor stimulation into natural daily routines, such as playing, dressing, eating, cleaning, and household activities. These discussions enabled participants to formulate realistic strategies for maintaining consistent developmental stimulation after completing the training program.

Program evaluation demonstrated positive participant responses toward all components of the training activities. Based on observation and participant feedback, the majority of parents showed improved understanding regarding motor development, increased confidence in implementing stimulation activities independently, and stronger awareness of the importance of family involvement in early intervention. Participants also expressed satisfaction with the educational methods because the combination of lectures, demonstrations, practical sessions, and mentoring allowed them to immediately apply newly acquired knowledge within authentic learning situations.

Overall, the implementation achieved its primary objectives by strengthening parents' knowledge and practical competencies regarding motor stimulation through family-based early intervention. Furthermore, the program successfully established collaborative relationships between the university, community institutions, and families, thereby creating opportunities for sustainable community empowerment in supporting early childhood development.

Table 1. Summary of Community Service Outcomes

Program Component	Main Findings
Needs Assessment	Parents demonstrated limited knowledge regarding child motor development and early intervention.
Educational Sessions	Participants improved their understanding of developmental milestones and family-centered intervention.
Practical Training	Parents successfully practiced gross and fine motor stimulation techniques using simple household materials.
Mentoring	Participants developed practical strategies for integrating stimulation into daily family routines.
Evaluation	Parents reported increased confidence, knowledge, and readiness to independently stimulate their children's motor development.

Discussion

The implementation results demonstrate that family-based motor stimulation training is an effective community empowerment strategy for improving parental competence in supporting early childhood development [12]. The substantial participant engagement observed throughout the educational and practical activities indicates that parents have a strong interest in obtaining practical knowledge regarding child development when the learning process is directly relevant to their daily parenting experiences [13].

The educational sessions successfully addressed participants' limited understanding of developmental milestones and early intervention. Interactive learning methods encouraged participants to actively construct new knowledge by integrating scientific information with their own parenting experiences [14]. This finding supports constructivist learning principles, which emphasize that meaningful learning occurs when learners actively participate in knowledge construction through interaction, reflection, and authentic experiences [15].

The practical demonstration and guided practice sessions played a significant role in improving participants' practical competencies. Rather than merely receiving theoretical explanations, parents directly experienced the implementation of various motor stimulation activities under professional guidance. This experiential learning approach enhanced participants' confidence and reduced uncertainty regarding the selection of appropriate developmental activities for their children. Similar findings have been reported in family-centered intervention studies, which indicate that demonstration and coaching are more effective than lecture-based education alone because they facilitate practical skill acquisition and long-term behavioral change [16].

Another important finding concerns the successful utilization of simple household materials for developmental stimulation. Many participants initially believed that effective intervention required expensive educational toys or specialized therapeutic equipment. However, the training demonstrated that everyday materials such as paper, blocks, ropes, balls, crayons, and household objects can effectively stimulate children's motor development when appropriately integrated into structured play activities. This finding is particularly important for community-based intervention because it enhances the accessibility and sustainability of developmental stimulation regardless of families' socioeconomic conditions [17].

The mentoring component further strengthened the effectiveness of the intervention by allowing facilitators to address participants' individual concerns and parenting challenges. Personalized consultation encouraged parents to adapt stimulation strategies according to their children's developmental characteristics rather than adopting standardized approaches. This individualized guidance reflects the principles of family-centered early intervention, which emphasize collaboration between professionals and families to develop interventions that are meaningful within each family's unique context [18].

The implementation also highlighted the central role of families in promoting children's developmental outcomes. Parents recognized that developmental stimulation should not be limited to formal educational settings but can be naturally integrated into daily family routines such as dressing, eating, bathing, playing, and household activities. This finding is consistent with routines-based early intervention, which suggests that repeated learning opportunities embedded within natural family environments produce more sustainable developmental outcomes than isolated intervention sessions [19].

Although the program produced encouraging outcomes, several implementation challenges were identified. Differences in participants' educational backgrounds influenced the pace of learning during practical activities, requiring facilitators to provide individualized guidance for some participants. Time limitations also reduced opportunities for extended practice and long-term monitoring of participants' implementation within their home environments. Therefore, future community service programs should incorporate periodic follow-up mentoring, home visits, or online consultation to ensure continued implementation of motor stimulation practices after the completion of the initial training [20].

Overall, the community service program demonstrated that integrating educational activities, practical demonstrations, mentoring, and family empowerment constitutes an effective model for improving parental competence in supporting children's motor development. The collaborative partnership established between the

university, community organizations, health services, and families further strengthens the sustainability of family-based early intervention and contributes to the broader objective of promoting optimal early childhood development within the community.

CONCLUSION

The community service program entitled "**Motor Stimulation Training through Family-Based Early Intervention for Young Children**" successfully achieved its primary objective of strengthening parents' knowledge and practical competencies in providing appropriate motor stimulation for their children. The implementation demonstrated that combining educational sessions, practical demonstrations, guided practice, mentoring, and reflective discussions effectively enhanced participants' understanding of child motor development and increased their confidence in independently implementing gross and fine motor stimulation activities within the family environment.

The program confirmed that a family-based early intervention approach is an effective community empowerment strategy because it positions parents as the primary facilitators of children's development. Through active participation, parents acquired practical skills that could be integrated into everyday family routines using simple, low-cost materials available at home. This approach not only improved participants' knowledge but also promoted positive behavioral changes by encouraging families to provide consistent developmental stimulation as part of their daily interactions with children.

Another important outcome of the program was the establishment of collaborative partnerships among the university, early childhood education institutions, Posyandu cadres, community health workers, local government, and families. This collaboration strengthened community awareness regarding the importance of early intervention and created opportunities for developing sustainable child development programs at the community level. Such partnerships are essential for extending the impact of community service activities beyond the initial implementation period.

Overall, the findings indicate that family-centered motor stimulation training provides practical benefits for parents and contributes to optimizing early childhood motor development. The program demonstrates that empowering families through evidence-based education and hands-on practice represents a feasible and sustainable model of community service that can be replicated in other communities with similar characteristics.

To enhance the long-term impact of the program, future community service initiatives should include periodic follow-up mentoring, developmental monitoring, and expanded training covering additional developmental domains, including language, cognitive, social-emotional, and adaptive skills. Strengthening

interdisciplinary collaboration among universities, educational institutions, healthcare providers, and local governments will further improve the sustainability of family-based early intervention programs and contribute to promoting optimal child development at the community level.

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