



Strengthening Adolescent Self-Regulation to Reduce Excessive Gadget Use: A Community-Based Pre-Post Study in Surabaya, Indonesia

Rozydendi Almelio¹, Suhadianto^{2*}

¹rozydendialmelio@gmail.com, ²suhadianto@untag-sby.ac.id

Universitas 17 Agustus 1945 Surabaya

*Corresponding Author: Suhadianto

E-mail: suhadianto@untag-sby.ac.id

ABSTRACT

Excessive gadget use among adolescents is shaped by individual habits, peer norms, family supervision, and community context. This study evaluated a brief community-based intervention designed to strengthen self-regulation among adolescents at risk of excessive gadget use in Margasari Urban Village, Surabaya, Indonesia. A mixed-methods, single-group pre-post design was used. Forty-six adolescents aged 13-18 years completed a 21-item screening questionnaire adapted from the Smartphone Addiction Scale, and 15 moderate- or high-risk adolescents (N = 15) participated in further assessment and intervention. The needs assessment combined interviews with three high-risk adolescents, one parent, and one neighbourhood representative, plus a focus group discussion. The intervention consisted of three 120-minute group psychoeducation sessions integrating self-monitoring, mindfulness-based pausing, self-rules, environmental structuring, and peer support, while parents and community representatives received educational materials. Knowledge scores increased from 46.23 to 83.11. Excessive gadget-use risk scores decreased from 71.20 to 65.80, a statistically significant reduction ($z = -2.97$, $p = .003$, $r \approx .77$). Average daily gadget use decreased from 5 hours 18 minutes to 5 hours 3 minutes, and parent-rated positive home behaviours increased from 16.07 to 18.13 ($z = -3.41$, $p < .001$, $r \approx .88$). Qualitative findings indicated improved self-awareness and greater use of concrete control strategies, although peer pressure, night-time habits, and inconsistent community regulation remained barriers. Brief self-regulation-focused psychoeducation with family monitoring and community support may initiate meaningful short-term change, although the absence of a control group and follow-up limits long-term conclusions.

Keywords: Adolescents, Community Intervention, Excessive Gadget Use, Problematic Smartphone Use, Self-Regulation

INTRODUCTION

Digital devices have become deeply embedded in adolescent life, functioning simultaneously as tools for learning, communication, entertainment, and identity exploration (Clemente-Suárez et al., 2024; Murad, 2024). The rapid expansion of internet-based technology has reshaped how young people access information and interact with their environment, a shift that has been shown to enhance engagement and accessibility in educational settings while also normalising near-constant connectivity (Agoi et al., 2025). These functions became especially prominent during the COVID-19 pandemic, when many families provided children with personal devices to sustain online learning; however, patterns initially developed for educational continuity may persist well after the original need has passed, and when device use becomes difficult to control and begins to interfere with sleep, schoolwork, or family interaction, it is more appropriately understood as problematic or excessive use rather than merely frequent use (Park & Park, 2021; Selak et al., 2025).

The literature distinguishes ordinary high engagement from clinically significant behavioural addiction. Screening constructs such as the Smartphone Addiction Scale were originally developed to identify patterns of overuse, withdrawal-like discomfort, daily-life disturbance, positive anticipation, and tolerance (Kwon et al., 2013), and this instrument remains the empirical basis for the adapted screening tool used in the present study; it is retained here as the origin of the measure rather than as a theoretical claim requiring replacement (Liu et al., 2022). Contemporary evidence continues to confirm that these indicators are useful for identifying adolescents who may benefit from preventive intervention before more severe impairment develops, since labelling young people as addicted risks increasing stigma, whereas a risk-oriented framing supports education and gradual behaviour change.

Self-regulation offers a useful theoretical lens for understanding why adolescents may recognise the negative consequences of excessive gadget use yet struggle to change their behaviour. Zimmerman's (2000) model of self-regulation, comprising metacognitive, motivational, and behavioural processes, is treated here as a grand theoretical framework and is retained accordingly; it explains how an adolescent may know that late-night scrolling is harmful yet fail to monitor elapsed time or structure the bedroom environment to support disengagement. Recent longitudinal evidence corroborates this account directly, showing that adolescents with weaker self-regulatory capacity follow a faster-increasing trajectory of problematic smartphone use over time, whereas stronger self-regulation is associated with a more stable, lower-risk trajectory (Xiao et al., 2025).

Digital environments intensify these regulatory demands because applications are designed to deliver rapid, repeated, and socially meaningful rewards. From a behavioural learning perspective, this dynamic reflects

reinforcement principles, a grand theoretical foundation that is retained rather than replaced (Skinner, 2014), in which pleasurable stimulation functions as positive reinforcement while escape from boredom or loneliness functions as negative reinforcement. Fear of missing out further compounds this pattern by increasing the perceived cost of disengagement, since adolescents may worry about missing shared conversations or trends; recent longitudinal research confirms that fear of missing out remains a significant predictor of problematic smartphone-use trajectories among contemporary adolescent cohorts, alongside self-regulation and emotional difficulties (Xiao et al., 2025), and that self-control interacts with offline behavioural alternatives such as physical activity to reduce this risk over time (Zhao et al., 2024).

Adolescent behaviour also develops within a nested ecological system. Bronfenbrenner's (1981) model, retained here as a grand theory, emphasises that individuals interact with multiple environmental layers: family rules and peer relationships at the microsystem level, the coordination between parents, schools, and community organisations at the mesosystem level, and broader community facilities and digital culture at the ecosystem and macrosystem levels. Within this framework, the role of adult figures beyond the family, including teachers and institutional actors, in shaping adolescent character and behavioural competence has been highlighted as a critical mesosystem-level lever for sustainable developmental outcomes (Silalahi, 2025), reinforcing the premise that an intervention directed only at adolescents is unlikely to succeed if family supervision remains inconsistent and community alternatives remain limited.

The present community-based case arose from concerns raised in Margasari Urban Village, Surabaya, where parents and neighbourhood representatives described adolescents remaining at public facilities to use free Wi-Fi until late at night, delaying schoolwork, and reacting defensively when asked to disengage from devices. These concerns are consistent with evidence that inconsistent parental mediation is closely linked to the persistence of problematic smartphone use in adolescents, operating through psychological need satisfaction and outcome expectations rather than through restriction alone (Chen et al., 2025), which suggests that a purely individual-level intervention would likely be insufficient without a parallel family and community component.

These concerns pointed to a multilevel problem encompassing weakened individual self-regulation, a digital parenting gap, reinforcing peer norms, and a regulatory and activity gap within the community, though the community also possessed meaningful assets, including an existing youth network and adolescent interest in sports, art, and other offline activities that could be leveraged to redirect peer influence. Brief psychoeducation is frequently used in community settings to increase knowledge and introduce practical skills within limited time and resources, and evidence from adjacent intervention literature indicates that outcomes are strengthened when structured practice components, such as mindfulness-based

techniques or rewarding offline physical activity, are combined with educational content rather than delivered alone (Li et al., 2023; Q. Liu et al., 2024).

Accordingly, this study evaluated a brief community-based intervention integrating self-regulation psychoeducation, mindfulness-based pausing, self-monitoring, self-rules, parental observation, and community educational support. It was hypothesised that participation in the programme would be associated with measurable short-term improvement in adolescents' knowledge, a reduction in excessive gadget-use risk scores, a decrease in daily gadget duration, and an increase in parent-observed positive behaviour, consistent with the study's three objectives of characterising at-risk adolescents, describing the multilevel factors maintaining the behaviour, and evaluating short-term programme outcomes. Because formal ethics-board documentation was not available for the underlying activity, this study is presented as a supervised professional-practice community intervention evaluated retrospectively as a case evaluation rather than as a prospective research trial, and this positioning is maintained consistently throughout the remainder of the article.

RESEARCH METHODOLOGY

This study used a community-based mixed-methods design with a single-group pre-post evaluation, combining quantitative screening with a qualitative needs assessment to formulate the case conceptualisation and adapt the intervention to the local context (Creswell & Creswell, 2023). The programme was conducted in Margasari Urban Village, Surabaya, Indonesia, an urban community comprising seven neighbourhood units and 34 smaller residential units, with approximately 9,000 residents and more than 2,200 households, many of whom worked in informal or micro-enterprise sectors that often-limited continuous parental supervision. Adolescent recruitment was facilitated through the local Youth Information and Counselling Centre, a programme under a community collaboration forum involving parents, adolescents, village representatives, and neighbourhood leaders, with activities centred at the RW 03 community hall, which also provided public Wi-Fi and served as a common gathering place for adolescents.

The initial screening involved 46 adolescents aged 13-18 years, comprising 32 female and 14 male participants, recruited from several neighbourhood units through the local youth programme. This figure represents the full population of adolescents enrolled in the Youth Information and Counselling Centre during the programme period rather than a sample drawn from a larger sampling frame; consequently, the statistics reported in this study are interpreted as a population-level description of this specific community cohort rather than as findings intended for statistical generalisation. Eligibility for the intervention was based on screening classification: adolescents in the moderate- or high-risk categories were invited to participate, while low-risk adolescents received preventive educational material. Fifteen adolescents met the intervention criterion, comprising 12 in the moderate-

risk category and three in the high-risk category, and because this group likewise reflected the entire eligible at-risk subpopulation rather than a further drawn sample, the inferential tests reported in Section 3 are presented as exploratory within-group comparisons rather than as tests intended to support broader generalisation. The qualitative needs assessment used purposive informants representing multiple ecological levels: three high-risk adolescents participated in individual interviews exploring subjective motives and previous attempts to regulate use, one parent representative who was also a local health care was interviewed regarding family rules and parenting responses, one neighbourhood representative active in youth affairs was interviewed regarding community facilities and policies, and a focus group discussion with adolescents explored peer influence and perceptions of existing youth activities.

Excessive gadget-use risk was assessed using a 21-item questionnaire adapted from the Smartphone Addiction Scale framework (Kwon et al., 2013) and translated into Indonesian for community use, covering overuse, withdrawal, daily-life disturbance, positive anticipation, and tolerance; items were rated on a five-point Likert scale, summed, and classified into low-, moderate-, and high-risk categories following the internal service protocol of the Youth Information and Counselling Centre, and because this protocol has not been separately published, the cut-off values should be regarded as programme-specific rather than externally validated. A reliability coefficient specific to this sample could not be computed because item-level responses were not retained in the working programme dataset, only the summed total scores; this is acknowledged as a limitation, and future application of the instrument in this setting should retain item-level data so that internal consistency can be reported directly. The same risk score was administered before and after the intervention to the 15 participating adolescents and analysed as paired data. Knowledge of excessive gadget use, its consequences, self-regulation, peer pressure, and control strategies was assessed with a pre-test and post-test transformed to a 0-100 scale and classified as low, moderate, or high; item-level data were likewise not retained, so knowledge outcomes were analysed descriptively. For two consecutive weeks, adolescents recorded daily gadget-use duration, triggers, and coping strategies, while parents completed a seven-item weekly observation sheet of positive behaviours rated from 1 (never) to 4 (always); both were reviewed during the sessions and summarised for Week 1 (2-8 June 2026) and Week 2 (9-15 June 2026). Semi-structured interviews and the focus group explored internal motives, family communication, community policy, and available alternative activities, following source triangulation across adolescents, a parent, and a neighbourhood representative to produce a contextually credible case formulation rather than a formal grounded theory.

The intervention consisted of three face-to-face group sessions of approximately 120 minutes each, delivered on 1, 9, and 16 June 2026 at the RW 03 community hall, with all 15 adolescents attending every session. The content

adapted basic psychoeducational material from the UGET module (Asih et al., 2023), integrated with self-regulation, mindfulness, and environmental-structuring techniques consistent with Zimmerman's (2000) framework. Session 1 established group norms, administered the knowledge pre-test, explained the consequences of excessive use, and guided a brief pause-notice-choose sequence before each adolescent developed a personal self-rule. Session 2 reviewed first-week monitoring and recurring triggers and revised self-rules to be more specific and environmentally supported. Session 3 reviewed adolescent and parent monitoring, reflected on achievements and barriers, and produced an individual maintenance plan, reframing peer influence as a source of positive mutual reminders. Parents received a booklet on collaborative gadget agreements and active mediation, neighbourhood representatives received guidance on Wi-Fi management and youth activities, and other adolescents received a preventive booklet and video.

Quantitative findings were summarised using frequencies, percentages, means, and standard deviations, and because the intervention group was small with non-normally distributed paired change scores, exploratory Wilcoxon signed-rank tests were calculated for pre-post excessive gadget-use scores and Week 1-Week 2 parent monitoring scores, interpreted cautiously given the absence of a control group and the population-level rather than sampled composition of the cohort. Qualitative material was organised into themes corresponding to the ecological case formulation, including self-regulatory difficulties, emotional and peer triggers, digital parenting gaps, community regulatory gaps, and community assets, and compared across informants to identify convergent and divergent perspectives. This activity was conducted as a supervised professional psychology community service under the internal and field supervision of the author's academic programme, consistent with standard curricular practice for practicum-based service activities that are typically exempted from separate ethics-committee review, and no additional formal ethics-approval number is available for citation in this report. Informed consent was obtained from each participating adolescent's parent or guardian individually, in coordination with the community representative, and each adolescent additionally provided verbal assent before taking part; participation was voluntary, participant identities were replaced with codes in the working records, and the screening instrument was presented as an early-risk indicator rather than a clinical diagnosis, with findings reported in aggregate throughout this article to protect confidentiality.

RESULT AND DISCUSSION

Screening Profile

Of the 46 adolescents screened, 31 (67.4%) were classified as low risk, 12 (26.1%) as moderate risk, and three (6.5%) as high risk, meaning 15 adolescents (32.6%) were included in the targeted intervention. Because this cohort represents the full eligible population screened during the programme period rather than a

drawn sample, this distribution is interpreted descriptively rather than as a prevalence estimate for adolescents generally.

Table 1 Screening characteristics of the community adolescent sample

Characteristic	Result
Total screened	46 adolescents
Age range	13-18 years
Sex	32 female; 14 male
Low risk	31 (67.4%)
Moderate risk	12 (26.1%)
High risk	3 (6.5%)
Intervention group	15 moderate/high-risk adolescents

Source: Processed by the researcher (2026)

Qualitative Needs Assessment

Five mutually reinforcing themes were identified. Interviewed adolescents demonstrated awareness without sustained behavioural control, recognising that late-night use interfered with sleep and schoolwork yet finding their own attempts at limit-setting short-lived. Gadgets served an emotional-regulation function, with boredom, loneliness, and anxiety about missing messages frequently triggering use, while peer practices maintained the behaviour through implicit rather than openly coercive pressure to remain included in shared games and conversations. Family regulation was inconsistent, with the interviewed parent describing a cycle of reminders, confiscation, conflict, and eventual return of the device without jointly agreed rules. The community showed a regulatory gap alongside meaningful assets: public Wi-Fi enabled late-night access and lecture-style programmes were considered unengaging, yet adolescents expressed clear interest in futsal, badminton, fishing, singing, drawing, and competitions, and the existing youth network and community hall provided resources for intervention. The focus group format elicited collective norms less visible in individual interviews, and participation became more open after an initially reserved period.

Table 2 Ecological themes and intervention implications

Level	Main finding	Intervention implication
Individual	Awareness of harm but weak monitoring, self-efficacy, and behavioural control	Self-monitoring, mindfulness-based pause, self-rules, environmental restructuring

Level	Main finding	Intervention implication
Peer	Online participation maintained belonging and shared conversation	Use group discussion and peer support; develop collective limits rather than individual prohibition
Family	Inconsistent rules and conflict-based restriction	Collaborative agreements, active mediation, positive reinforcement, consistent observation
Community	No written guidance; programmes perceived as passive and uninteresting	Manage communal Wi-Fi, establish persuasive agreements, provide interactive sports and creative activities
Assets	Youth network, community hall, interested adults, shared non-digital interests	Build a sustainable community-based programme using existing structures

Source: Processed by the researcher (2026)

Programme Outcomes

All 15 adolescents attended the three sessions and completed both weeks of self-monitoring, with parents completing both weekly observation sheets. Concrete techniques, particularly disabling notifications and charging devices outside the bedroom, were adopted more readily than mindfulness exercises. During Week 1, mean recorded use was 5 hours 18 minutes per day, with high-risk adolescents averaging approximately 7 hours 11 minutes against 4 hours 49 minutes for moderate-risk adolescents, and common triggers included boredom, social-media checking, and game notifications.

Knowledge scores rose substantially, from a mean of 46.23 before psychoeducation to 83.11 after Session 1 (+36.88 points), with the proportion of adolescents in the high-knowledge category increasing from 20.0% to 86.7% and no participant remaining in the low category. The excessive gadget-use risk score decreased from a mean of 71.20 (SD = 14.10) to 65.80 (SD = 17.70), with 11 adolescents improving, two unchanged, and two showing a small increase; recalculated using the normal approximation to the Wilcoxon distribution based on the 13 non-tied pairs reported, this reduction was statistically significant, $z = -2.97$, $p = .003$, matched-pairs rank-biserial $r \approx .77$, indicating a large effect. Only one participant moved to a lower risk category, and all three initially high-risk adolescents remained high risk, suggesting the brief format was more responsive for moderate-risk than high-risk participants.

Average daily gadget use decreased from 5 hours 18 minutes in Week 1 to 5 hours 3 minutes in Week 2 (-15 minutes/day), with weekend use more resistant to change than school-day use. Parent-observed positive behaviour increased from a mean of 16.07 (SD = 3.28) to 18.13 (SD = 3.54), with all 15 adolescents improving; recalculated using the same normal-approximation method, $z = -3.41$, $p < .001$, rank-biserial $r \approx .88$, a large effect, though no participant changed category. As the

weekly diaries were completed sequentially by the same parent rather than by an independent or blinded rater, the possibility of an observer effect cannot be ruled out and is addressed in the Discussion. Given the exploratory, hypothesis-generating framing of these two planned comparisons, no correction for multiple comparisons was applied.

Table 3 Short-term intervention outcomes

Outcome	Baseline/Week 1	Post/Week 2	Observed change
Knowledge score, mean	46.23	83.11	+36.88
Excessive gadget-use risk score, mean (SD)	71.20 (14.10)	65.80 (17.70)	-5.40; $z = -2.97$, $p = .003$, $r \approx .77$
Daily gadget duration	5 h 18 min	5 h 3 min	-15 min/day
Parent-rated positive behaviour, mean (SD)	16.07 (3.28)	18.13 (3.54)	+2.06; $z = -3.41$, $p < .001$, $r \approx .88$

Source: Processed by the researcher (2026)

Maintenance Plans and Remaining Barriers

By Session 3, all adolescents developed a maintenance plan, most commonly a consistent night-time limit, keeping the phone outside the bedroom, and replacing screen time with reading, sports, or pet care. The principal barriers were long-standing night-time and weekend habits, peer invitations, constant notifications, and the absence of structured community alternatives, with higher-risk adolescents changing less consistently than the moderate-risk group.

This study evaluated a brief community-based self-regulation programme for adolescents at moderate or high risk of excessive gadget use, showing substantial short-term knowledge gains, a statistically significant and large-effect reduction in risk scores, a modest reduction in recorded daily duration, and a significant, large-effect improvement in parent-observed behaviour, alongside high attendance and monitoring completion that indicate the intervention was feasible and acceptable within this setting.

The pattern of individual change was more informative than the group mean alone: only one adolescent shifted to a lower risk category, and all three initially high-risk participants remained high risk, indicating that a three-session programme may initiate control among adolescents with emerging problems but is likely insufficient for those with more established patterns, who reported longer use, later stopping times, and greater difficulty sustaining limits. This distinction is consistent with longitudinal evidence that weaker self-regulatory capacity predicts a faster-worsening trajectory of problematic smartphone use over time, whereas stronger self-regulation predicts a more stable trajectory (Xiao et al., 2025), suggesting that high-risk adolescents may need a longer, more individually tailored intervention

rather than an extension of the present group format. The knowledge gains were considerably larger than the behavioural gains, a common and expected pattern given that learning can occur within a single session, whereas habits maintained by emotional relief and environmental cues require repeated practice; this gap does not indicate durable behaviour change and future evaluations should include delayed testing to examine retention.

The modest reduction in daily duration should be read alongside the finding that adolescents increasingly substituted device uses with household responsibilities, conversation, and pet care during the second week. This pattern is consistent with intervention evidence showing that rewarding offline activity, including structured physical activity, protects against problematic smartphone use over time by strengthening self-control rather than by restriction alone (Q. Liu et al., 2024; Zhao et al., 2024), which suggests that the community's expressed interest in sports and creative activities is not incidental but a genuine lever for sustaining the gains observed here. Peer influence functioned as both risk and potential mechanism of recovery, operating less through direct pressure than through conversational inclusion, consistent with fear of missing out remaining a significant predictor of problematic use trajectories in recent adolescent cohorts (Xiao et al., 2025); this implies that effective follow-on programming should reframe peer groups as a source of collective self-rules and mutual reminders rather than treat peers only as a negative influence to be resisted.

The improvement in parent ratings, and the fact that gains were largest for behaviours parents could directly prompt rather than those requiring autonomous adolescent control, aligns with evidence that active parental mediation, involving discussion and joint negotiation of expectations, is more constructive for reducing problematic smartphone use than surveillance or restriction alone (Chen et al., 2025). Because parents were not blinded to week order in this self-administered weekly diary, increased attentiveness during the observed period cannot be separated from genuine behavioural change; even so, greater parental involvement is itself a relevant outcome, since inconsistent supervision was part of the original problem, and future evaluations should pair parent ratings with objective indicators such as screen-time logs.

At the community level, public Wi-Fi provided both a gathering place and a channel for late-night use, while adolescents' clear interest in sports, art, and competition alongside low attendance at lecture-style programmes indicates disengagement from format rather than general apathy. A persuasive, participatory approach, involving agreed Wi-Fi hours and adolescent participation in designing rules, is therefore likely to be more sustainable than a rigid access ban, which could displace adolescents to less supervised settings. The intervention also demonstrated the value of matching technique to developmental preference, since participants adopted concrete behavioural actions more readily than mindfulness exercises; brief, concrete forms of mindfulness linked to a specific trigger are likely to be more

acceptable than an abstract meditation practice, and more intensive mindfulness-based programmes achieving benefits for problematic phone use and sleep have typically required more sessions and structured practice than could be offered here (Q. Liu et al., 2024).

The mixed-methods, asset-oriented design, high implementation fidelity, and transparent reporting of null and adverse individual-level findings alongside the significant group means are notable strengths that should be preserved in any future replication of this model. The principal limitations are the small, single-community sample interpreted at the population rather than sampling level, the single-group design without a control group or follow-up, self-reported duration data, unblinded parent observation, and the absence of a sample-specific reliability coefficient for the adapted screening instrument due to the loss of item-level data; the latter is addressable in future implementations simply by retaining raw item responses rather than only summed scores.

CONCLUSION

A three-session community-based psychoeducation programme integrating self-monitoring, mindfulness-based pausing, self-rules, environmental structuring, parent observation, and community educational support produced promising short-term changes among 15 adolescents at risk of excessive gadget use. Participants showed substantial gains in knowledge, a statistically significant and large-effect reduction in screening scores, a modest decrease in daily gadget duration, and a significant, large-effect improvement in parent-observed positive behaviour, with qualitative findings indicating greater awareness of triggers and increased use of concrete control strategies.

The programme did not produce uniform change, and the initially high-risk adolescents remained the most difficult to support within the brief timeframe. Peer norms, late-night habits, inconsistent household rules, and limited community alternatives continued to maintain excessive use, indicating that the intervention is best understood as an initial preventive and early-intervention model rather than a definitive treatment. Continued family mediation, structured peer support, attractive offline activities, and longer-term monitoring are necessary to consolidate the changes observed.

Community interventions that align individual self-regulation with family and community-level support may offer a feasible and non-stigmatising approach to promoting healthier digital habits among adolescents, particularly when they build on existing community assets rather than relying on prohibition alone. Future implementation of this model would benefit from a larger sample, a comparison group, retained item-level instrument data, and follow-up assessment to determine whether the short-term gains reported here are sustained over time.

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