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Group-based economic incentives to improve adherence to antiretroviral therapy among youth living with HIV: safety and preliminary efficacy from a pilot trial

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Abstract

Poor adherence to antiretroviral therapy (ART) has significant consequences for adolescents. Conditional economic incentives (CEI) is an approach that may help address this challenge. This study evaluated the safety and preliminary efficacy of a group-based CEI program for ART adherence improvement among a sample of adolescents living in Ghana. A total of 35 adolescents (mean age: 14.7 years) on ART, though still with detectable viral load, were recruited from an HIV clinic and divided into 5 balanced groups to participate in peer-led group-based CEI activities during routine clinic visits. Four assessments were conducted across four visits at baseline and 3-, 6-, and 9-month follow-up, respectively. Main outcomes were ART adherence and viral load. Linear mixed models and thematic analysis were used for data analyses. The majority (91.4%) of the participants attended all four intervention activities. Participants reported missing an average of 1.06, 0.50, 0.91, 0.55 doses of ART in the past 7 days at baseline, 3-, 6-, and 9-month assessments, respectively. Most viral loads were $\leq 5,000$ copies/ml at both baseline (68.6%) and 6-month assessments (54.3%). The incentive was divided between individual compensation for attending clinic and completing the assessment (\$5 each, \$20 in total) and a group-based compensation valued at \$40 that was distributed during the 9-month assessment according to average group attendance (A 90%, B 75%, C 60%, D <60%) and group-average viral load (A=undetectable, B=50–499, C=500–4999, D $\geq 5,000$). The mean earnings for the participants was \$46.70 (77.8% of

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possible earning). Qualitative data suggested that the CEI helped ART adherence through gaining personal and group benefits. Participants reported no teasing, bullying, or other undesirable behaviors from group members. They liked getting money for attending clinics/group meetings and obtaining undetectable viral load. We concluded that a group-based CEI was safe and had the potential to improve ART adherence and reduce viral load among Ghanaian adolescents.

Keywords

group-based conditional economic incentive; treatment adherence; youth living with HIV; pilot trial; group cohesion; stigma

Introduction

Poor adherence to antiretroviral therapy (ART) has significant consequences for young people living with HIV (YPLH): immunologic failure, disease progression, and increased risk of transmitting the virus (Lowenthal et al., 2014). Social support could improve treatment adherence, and interventions that provide peer support could reduce HIV-related stigma, increase HIV knowledge, and improve health outcomes (Barker et al., 2019). Adolescents develop new skills and habits, as they become increasingly independent from parents and navigate peer contexts and norms. Treatment adherence and social group formation are ideal intervention targets because early adherence and social support predict long-term adherence (Lindsey, Bosch, Rudy, & Flynn, 2009).

In sub-Saharan Africa, limited resources and HIV-related stigma are prominent barriers that can interfere with YPLH's ability or motivation to travel to the hospital for routine clinical care (Agwu & Fairlie, 2013). The challenge is to increase motivation to attend clinic, improve adherence to ART, and build HIV-related social support while respecting logistical constraints of under-resourced clinics and patients' limited resources. Conditional economic incentives (CEI) is an approach applied in behavioral interventions for ART adherence (Simoni, Amico, Pearson, & Malow, 2008) that may help address these challenges (Fiszbein & Schady, 2009; Galárraga & Sosa-Rubí, 2019).

CEIs can increase clinic attendance, improve medication adherence, and reduce HIV risks (Galárraga, Genberg, Martin, Laws, & Wilson, 2013; Operario, Kuo, Sosa-Rubí, & Gálarraga, 2013). CEIs are traditionally conditional on individual-level outcomes (e.g., individual clinical attendance). To our knowledge, there is no published work investigating CEIs that are conditional on group-level outcomes (e.g., the group average viral load). Group-based CEIs are promising among YPLH as adolescent behavior is strongly influenced by peers, and adolescents may have a strong sense of belonging. Using CEI in the context of a supportive peer-group might motivate them to behave to benefit the group and may create tendencies to improve the cohesion necessary for therapeutic benefit of peer groups as well as improve individual treatment adherence.

The objective of this study was to evaluate the safety and preliminary efficacy of a group-based CEI program for ART adherence improvement among a sample of YPLH living in Ghana. Two important markers of ART adherence improvement are reduced viral load and

increased CD4 cell count (Bangsberg et al., 2001). Therefore, outcomes of interest in the present study were ART adherence, CD4 cell count and viral suppression. Economic incentives were paid to the participants based on individual attendance and group average viral load level achieved after the intervention.

Methods

Participants

A total of 35 YPLH were recruited from an adolescent HIV clinic located at Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana. Eligibility criteria were: (a) 12–19 years of age, (b) perinatally-acquired HIV infection, (c) on ART and had a detectable viral load at baseline, (d) willingness to consent to participation. Participants with advanced illness that impaired cognitive ability to provide informed consent were excluded. Perinatally-acquired HIV cases were confirmed by the local clinic; patients were tested and confirmed by DNA/RNA polymerase chain reaction (PCR) when they were infants.

Study design and data collection

Recruitment was during routine clinic visits at KATH adolescent clinic, which provided care to 180 YPLH at the time of the study. All these visits were held in the morning, and the adolescent patients were seen by doctors on a first-come-first-served basis. The waiting time at the clinic was generally as long as 3 hours.

Participants were screened and contacted prior to a regularly-scheduled clinic visit and assigned to a group. After considering the patient's appointment date, age, gender, and disease severity, the clinical team divided enrolled participants into 5 generally balanced groups, and each group consisted of 7 patients who had their quarterly clinic visits scheduled together. (This ensured a diverse mix by age, gender, and disease severity; the groups did not have exactly the same composition.) Enrolled patients used their wait times to participate in group-based activities during their routine clinic visits, and no extra visit was needed for participating in this study.

There were assessments at baseline (prior to group formation), and at the 3-, 6-, and 9-month follow-up visits. Participants completed assessment battery at baseline and then met together with their peer group for the first group meeting. Participants in the same group met quarterly by synchronizing their next 3 visits for the second to fourth group meetings. The participants had to provide assent if younger than 18, and consent as well if they were 18. Written consent was obtained from participants' parents if the participants were younger than 18.

Intervention

CEI: Conditional on attendance and group average viral load, potential maximum total earnings for each participant was \$60. The incentive was divided between individual compensation for attending clinic and completing the assessment (\$5 each, \$20 in total) and a group-based compensation valued at \$40 that was distributed during the 9-month assessment according to group-average attendance and group-average viral load

(A=undetectable, B=50–499, C=500–4999, D =5,000). The incentive based on group-average attendance was paid according to the total number that group meetings were attended by all 7 participants in the same group. For example, in group A, 4 participants attended 4 groups meetings, 2 participants attended 3 group meetings, and 1 participant attended 2 group meetings; as a result, each of these 7 participants in Group A would receive a total of \$24 ($4*4+2*3+1*2=24$). The incentive based on group-average viral load was paid according to the average viral load among all 7 participants in the same group. In detail, \$12 would be paid when the average viral load was undetectable, \$8 when 50–499 copies/ml, \$4 when 500–4999 copies/ml, and \$0 when =5,000 copies/ml. Groups received an incentive based on a grade system, which was used among adults before (Farber et al., 2013).

In-clinic peer-group: The content of the in-clinic peer-groups was based on the Social Learning Theory, which describes how peer groups influence group members. Following this theory, patients received a brief introduction on the reason for forming a group and on appropriate group behavior; they selected a group name to provide a sense of identity and selected a group leader. The group leader received additional training on how to motivate group members, and phone credits to communicate with them between clinic visits. At each clinic visit, the groups received a brief didactic session, participated in a group-building activity, participated in supervised discussion of HIV-relevant topics, and had time to socialize. The didactics, group-building activities, group discussions, and leadership training were adapted from USAID's publication entitled "Positive Connections: Leading Information and Support Groups for Adolescents Living with HIV (FHI 360, 2013)."

Quantitative assessment and analysis

Procedures: Participants completed paper-based questionnaires prior to the start of each group meeting. Blood samples were taken at baseline and at the 6-month visit.

Measures: (a) *Clinical outcomes:* Attendance records and chart reviews assessed individual and group clinic attendance. CD4 count and viral load were assessed at baseline and 6-month visits. (b) *ART adherence:* The Visual Analog Scale (Kalichman et al., 2009) and adherence module from Pediatric AIDS Clinical Trials Group (Van Dyke et al., 2002) were used to assess the participant's ART adherence. The analog scale asked participants to circle how much of each medication they took during the past month. The adherence module included questions on "*Thinking about the last weekend (Friday, Saturday and Sunday), how many doses of your HIV medication did you miss?*" and "*Thinking about the last 7 days, how many doses did you miss?*" The actual number of missed doses was reported. (c) *Group process measures:* The 25-item Group Cohesion Scale-Revised (Treadwell, Lavertue, Kumar, & Veeraraghavan, 2001) was collected at the 9-month assessment. This scale assessed how much the members of a group liked each other or the amount of friendship. An item was "*There is a feeling of unity and togetherness among group members.*" Each item was rated on the 4-point scale from strongly disagree (1) to strongly agree (4). The scale total score was obtained by summing up the 25 items, and higher score indicated a higher level of group cohesion. (d) *Perceived HIV-related stigma* (Wolitski, Pals, Kidder, Courtenay-Quirk, & Holtgrave, 2009): the 12-item Perceived HIV-related Stigma Scale was used to measure both internal and external HIV stigma. An item was "*Having HIV makes*

me feel I am a bad person.” Each item was rated on the 4-point scale from strongly disagree (1) to strongly agree (4). A total score was obtained by summing up the 12 items; higher scores indicated more stigma. Safety was assessed by participant’s self-reporting regarding teasing, bullying, coercion, or other undesirable behaviors from group members using the Multidimensional Peer-Victimization Scale (Mynard & Joseph, 2000) at each assessment. Participants were also asked if there were any intended or unintended disclosures of their HIV status by group members.

Data analysis: After showing descriptive statistics, we classified participants into subgroups based on viral load and CD4 cell counts, with meaningful clinical cut-offs. There were four subgroups based on viral load (<50, 50–499, 500–4999, 5,000) and four subgroups based on CD4 count (<200, 201–399, 350–499, 500). A linear mixed model examined the preliminary efficacy of the intervention on ART adherence, log (base 10) viral load, and CD4 cell counts, adjusting for background characteristics (sex, age, education, type of caregiver) and group membership (Galecki & Burzykowski, 2013). Since this was a before-and-after comparison the “intervention” in the statistical model were the assessment periods, namely, baseline, 3-, 6- and 9-month assessments (coded as 0, 1, 2 and 3). Specifically, we used exact CD4 cell count and log10 viral load in separate linear trend equations as main biological outcomes; and then repeated the same methods for ART adherence measured by missing doses in the past 7 days (continuous), and ART adherence score in the past 30 days (continuous). The lmer function in the lme4 package for R 3.5.3 determined restricted maximum likelihood (REML) estimates of the parameters. Two-tailed $p < 0.05$ was considered as statistical significance, and we provided point estimates as well as 95% confidence intervals (CIs).

Qualitative assessment and analysis

After the 9-month visit, we conducted exit interviews among all participants. The main question was *whether* and, if so, how the group-based CEIs helped their ART adherence. To assess acceptability, we also collected participants’ opinions on the type of incentive (e.g., cash, voucher), amount of incentive, and frequency of the incentive to be given. Interviews were conducted in the local language and took about 30 minutes to complete. Interviews were translated and transcribed in English. All transcripts were read several times, and meaningful units were coded throughout the transcripts. Thematic analysis was used to understand how the group-based economic incentives helped the ART adherence.

Results

Participants characteristics

Among the enrolled 35 participants, the median age was 14 years (IQR 14 to 16). More than half of the participants (62.9%) were male. The majority (88.6%) of their caregivers were parents. Around half of the participants took one pill a day while the other half took more than one pill a day. One-fifth of the participants had full clinical attendance during the study period, 28.6% of the participants completed 80–99% of their scheduled visits, and 45.7% completed 50–79%. The majority (91.4%) of the participants attended all 4 peer-group

meetings, 5.7% attended 3 meetings, and one participant did not attend any of these meetings. (Table 1)

Conditional payments

The majority (88.6%) of participants received full compensation payment (\$20 in total) according to the individual-based full attendance. Also, 14 (40.0%) participants from two of the seven groups received full compensation payment (\$28 in total) due to the group-based full attendance (defined by everyone in the group attended all meetings). However, 28 (80.0%) participants from six of the seven groups received no payment due to the group-based viral load level ($> 5,000$ copies/ml on average) while the other 7 participants received \$4 each for obtaining an average viral load of 500–4999 copies/ml among all group members. Participants could have earned \$60 if they displayed a perfect record of group meeting attendance and obtained an undetectable group-level viral load. However, no participant earned \$60, and the mean earnings for the participants was \$46.70 (77.8% of possible earning). (Table 1)

Safety and acceptability of the intervention

Participants reported no teasing, bullying, coercion, or other undesirable behaviors from group members. There were no reports of unintended disclosure, suggesting that all participants respected the agreement of keeping information shared during group meetings confidential. Overall, participants found the group meetings interesting and helpful. Group members felt free to share information, opinions, and feelings; they were also comfortable in expressing disagreements and receptive to feedback and criticism. There were no “back-stabbing” or unhealthy competitive attitudes among group members.

Participants liked the idea of getting money for attending clinics and group meetings. They felt happy to take the money in cash. The current amount of incentive for them was acceptable, and they were happy to collect the incentive when they came to the clinic. They wanted the incentive program to be continued until they can earn money by themselves. Some participants preferred to save the small amount of money at each visit for gifts at special events (e.g., Christmas). Because of the compensation, the majority of the participants found no difficulty with transportation from home to the meeting location.

Preliminary efficacy of the intervention

Participants reported missing an average of 1.06, 0.50, 0.91, 0.55 doses in the past 7 days at baseline, 3-, 6-, and 9-month assessments, respectively. We observed a decreasing trend (not statistically significant) for missing doses during the study period (coefficient: -0.12 , 95% CI $(-0.31, 0.07)$), meaning the number of missed doses decreased by 0.12 doses every three months. The change in missing doses between baseline and 9-month assessments was statistically significant (coefficient: -0.19 , 95% CI: $-0.38, -0.03$), meaning the number of missed doses decreased by 0.19 doses. Compared to baseline (48.6%), more participants reported full ART adherence at each follow-up (67.6%, 52.9%, 69.7%), but such change was not statistically significant. Similarly, for missing doses in the past weekend, participants scored 80, 90, 80, 80 (out of 100) with the Visual Analog Scale at baseline, 3-, 6-, and 9-

month assessments, respectively. No significant changes in score were found among these assessments (coefficient: -2.10 , 95% CI (-4.46 , 0.25)). (Table 2)

We classified participants into 4 subgroups based on viral load, including <50 , $50-499$, $500-4999$, and $\geq 5,000$ copies/ml; participants presented no changes in subgroup distributions of viral load between baseline and 6-month assessments. Most viral loads were $\geq 5,000$ copies/ml at both baseline (68.6%) and 6-month assessments (54.3%). Few were virally suppressed: 0 at baseline (per protocol), 2 at 6-month assessment. The medians of viral load were 4.14 (IQR 3.33 to 4.79) and 4.07 (IQR 3.31 to 4.93) log (base 10) units at baseline and 6-month assessments; we found no significant changes between assessments (coefficient: -0.05 , 95% CI: -0.21 , 0.31).

We also classified participants into 4 subgroups based on CD4 cell count: <200 , $201-349$, $350-499$, and ≥ 500 ; participants presented no changes in subgroup distributions of CD4 cell count between baseline and 6-month assessments. A few participants had CD4 cell counts ≥ 500 : 2 at baseline and 4 at 6-month assessment. The medians of CD4 cells were 329 (IQR 164 to 415) and 200 (IQR 105 to 408) at baseline and 6-month assessments; we found no significant change between assessments (coefficient: -25.09 , 95% CI: -104.12 , 53.94). (Table 2)

In terms of perceived HIV-related stigma, participants scored 26.3 (SD= 3.7) at baseline assessment and 25.3 (SD= 3.8) at 9-month assessment; no significant changes in score were found among these assessments (coefficient: -0.26 , 95% CI (-0.86 , 0.34)). Similar results were found when investigating internal stigma and external stigma separately.

Participants' ideas of how the economic incentive helped ART adherence

Table 3 presents themes and subthemes from qualitative analysis. Two themes emerged, including that the economic incentive helped ART adherence for personal (own) benefit and it helped ART adherence for the group (collective) benefit.

Six subthemes emerged to explain how the money helped ART adherence for personal benefit. To help ART adherence, the money functioned as a reminder, a reason, an instrumental support, a reinforcement, a contribution to the family, and a social desirability. For example, “*The money made me not forget about the drug anymore*” (a reminder). “*Most people do not have money to buy food to eat when taking their medications; I use the money to buy food*” (an instrumental support). “*Today I didn't get the promised money, so when I go home, I will take my medication seriously in order to get some of the promised money next time*” (a negative reinforcement).

Four subthemes emerged to explain how the money helped ART adherence for group benefit. To help ART adherence, the money functioned as positive peer pressure, a peer reminder, a symbol of adhering to subjective norms, and a new sense of excitement and purpose. For example, “*I take it every day because they [group members] will ask me at the meeting*” (a positive peer pressure). “*We do buy [phone] credit to call others to remind them to take the drug*” (a symbol of adhering to subjective norms). (Table 3)

Discussion

Overall, this pilot study found that a group-based CEI did not have a statistically significant effect on viral load and CD4 count among an HIV-positive sample of Ghanaian adolescents ages 13–18. However, the preliminary trends were promising, and as suggested by the qualitative results, economic incentives were acceptable, safe and might help ART adherence among adolescents through two mechanisms: personal benefit (including family) and group benefit. Because adolescents remain dependent on their family caregivers, financial hardship in the household may prevent HIV care and service utilization. Participants reported that provision of economic incentives could address transport costs and food security, which are barriers to adherence (McCoy et al., 2015). Also, the group-based incentive might facilitate development of group cohesion, thus enabling positive therapeutic outcomes beyond adherence. Themes that emerged from interviews (e.g., a new sense of excitement and purpose) provided direct evidence that group cohesion may be key to explain how economic incentives help ART adherence for the benefit of the group.

Despite high self-reported adherence, we found the two clinical indicators not fully satisfactory: a large proportion of unsuppressed viral load cases and a low average level of CD4 cell counts. We will explore reasons in future studies. First, we measured viral load only twice (due to budget constraints): at baseline and the 6-month interval, yet it may take longer to achieve viral load suppression after sustaining adequate treatment adherence. Also, 95% of participants have been on first-line since childhood with higher chances of developing resistance, which can impede the pathway from adherence to viral suppression.

To the best of our knowledge, this is the first study to test the safety and preliminary efficacy of group-based CEIs, as a novel intervention strategy, on ART adherence. Our findings contribute to a small yet expanding body of evidence on economic interventions for adolescent populations in resource-limited settings, which have been rarely investigated in longitudinal cohorts. Although it was a small pilot, the evaluation had both scientific and practical merits from three perspectives. First, we used a mixed study design to do the assessment comprehensively on the trial's safety and preliminary efficacy. Second, the outcome measures on ART adherence were comprehensive, together with clinical data confirmation (in the sense that viral load and CD4 cell count should reflect ART adherence). Third, the trial had three follow-ups during a 9-month period, which was longer than most other similar trials (Galarraga, Genberg, Martin, Barton Laws, & Wilson, 2013; Galárraga & Sosa-Rubí, 2019).

There are limitations to consider when interpreting the results. First, the current design by conducting a single arm of peer-led CEI activities could not separate the effect of economic incentive on the ART adherence from the potential effect of the peer group. The effect on ART adherence and clinical outcomes should be interpreted as the result of the combination of both. A comparison condition of peer group intervention only is needed to separate such effect. Second, (again due to budget constraints) there was no baseline ART resistance testing of the adolescents who had a detectable viral load at enrollment. If ART resistance exists, good treatment adherence due to the intervention may not be reflected in viral load suppression. Third, the small sample size did not allow us to estimate the effect sizes of the

intervention, and subgroup analyses (e.g., male/female) were not possible. However, as a pilot study with three follow-ups, the current sample size is acceptable when compared to similar published studies.

Although the above limitations suggest caution in interpreting the preliminary efficacy of providing group-based CEI program, the extant results seem promising, given the increasing trend of ART adherence. We suggest a larger fully-powered randomized trial in future studies with comparable control groups and further testing on whether the effect could be sustained after the incentive is removed. Mediator analyses are recommended to understand how CEIs work while moderator analyses are recommended to identify which subgroups are more likely to gain benefits from the CEIs.

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Table 1.**Participant characteristics and exposure to programs**

	N	Percent
Socio-demographics		
Age (years)		
13–14	20	57.1
15–16	9	25.7
17–18	6	17.1
Sex		
Male	22	62.9
Female	13	37.1
Education (N=34)		
Below senior high school	19	54.3
Senior high school	15	42.9
Type of caregiver		
Not parents	4	11.4
Parents	31	88.6
Exposure to program		
Percentage of appointments kept during the study period (N=34)		
<50%	1	2.9
50–79%	16	45.7
80–99%	10	28.6
100%	7	20.0
Percentage of group meetings attended (N=35)		
<100%	4	11.4
100%	31	88.6
Compensation payment		
Compensation amount for individual attendance		
\$20 *	31	88.6
<\$20	4	11.4
Compensation amount for group attendance (per person)		
\$28 *	14	40.0
<\$28	21	60.0
Compensation amount for group viral load (per person)		
\$12 when undetectable *	0	0.0
\$8 when 50–499 copies/ml	0	0.0
\$4 when 500–4999 copies/ml	7	20.0
0 when ≥5,000 copies/ml	28	80.0
Total compensation amount for each participant		
\$60 *	0	0
\$52	7	20.0

	N	Percent
Range: \$47–48	19	54.3
Range: \$29–44	9	25.7
Group process measures at visit 3 (Mean±SD, N=32)		
Group Cohesion Scale (range: 25–100)	78.8±5.9	
Perceived HIV-related stigma (Mean±SD) (range: 12–48)		
Perceived HIV-related Stigma Scale at baseline (N=34)	26.3±3.7	
Perceived HIV-related Stigma Scale at visit 3 (N=32)	25.3±3.8	

*
Potential maximum total earnings

Table 2.

ART adherence and clinical indicators

	Baseline visit	Follow up visits		
		3-month	6-month	9-month
ART adherence				
Number of missed doses in the past 7 days (Mean±SD)) (Median (Q1, Q3))	1.06±1.37 1 (0, 2)	0.50±0.79 0 (0, 1)	0.91±1.38 0 (0, 2)	0.55±1.30 0 (0, 1)
Proportion of participants with any missed dose in the past 7 days	18/35	11/34	16/34	10/33
ART adherence score ^f in the past 30 days (Mean±SD)	83±21	86±15	79±13	78±12
Proportion of participants scored <100 in the past 30 days (Median (Q1, Q3))	90 (70, 100) 21/35	90 (78, 100) 20/34	80 (70, 90) 28/34	80 (70, 90) 31/32
Clinical indicators				
Viral load (copies/ml)	Log 10		Log 10	
(Mean±SD)	4.08±0.92		4.10±1.00	
(Median (Q1, Q3))	4.14 (3.33, 4.79)		4.07 (3.31, 5.02)	
<50	0/35	-	2/35	-
50–499	2/35	-	2/35	-
500–4999	9/35	-	11/35	-
5,000	24/35	-	19/35	-
CD4 number (median, mean)				
(Mean±SD)	295±157		272±239	
(Median (Q1, Q3))	327 (164, 415)		200 (78, 415)	
<200	9/35	-	16/33	-
201–349	10/35	-	7/33	-
350–499	14/35	-	6/33	-
500	2/35	-	4/33	-

ART: Antiretroviral therapy

[/] ART adherence score ranged from 0 to 100 (worst adherence to best adherence)

Table 3.

Qualitative themes on how the money helped with ART adherence among adolescents

Themes	Subthemes	Exemplary Quotes
A. The money helps ART adherence for (own) personal benefit	A1. A reminder	The money made me not forget about the drug anymore; My mother used to tell me to take my medication, but because of the money, I always remember to take my medication.
	A2. A reason (added dimension)	We are taking the medicine because of the money.
	A3. An instrumental support (in the form of buying food)	Most people do not have money to buy food to eat when taking their medications. I use the money to buy food.
	A4. A positive (negative) reinforcement	Today I didn't get the promised money, so when I go home, I will take my medication seriously in order to get some of the promised money next time; If you don't take your drug, you won't get the money.
	A5. A contribution to the family	The money encouraged me to take our medication and also support my parent.
	A6. A social desirability	If they [the researchers] give us the money and we don't take the drug, they feel disturbed/they are worried.
B. The money helps ART adherence for (collective) group benefit	B1. Positive peer pressure	I take it every day because they [group members] will ask me at the meeting [so our group can get the reward].
	B2. Reminder from peer	I like to be called by my leader to remind me to take my medicine.
	B3. A symbol of adhering to subjective norms among peers	Sometimes, we do buy [phone] credit with it to call others to remind them to take the drug.
	B4. A new sense of excitement and purpose	I think peer support groups are an excellent idea to increase compliance. I noticed a new sense of excitement and purpose with regards to taking their drugs and coming to the clinic.

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