Financial Concerns and Sleeplessness

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Abstract

Do concerns about personal finances lower sleep quality and cognitive performance? Using a regression discontinuity research design, we find that eligible household heads surveyed just after the disbursement of an unconditional cash transfer in Indonesia report a 0.4 standard deviation (sd) improvement in sleep quality as compared to those surveyed just before the cash disbursement. Eligible household heads also perform better on cognitive indicators sensitive to sleep deprivation (memory and attention) but not on cognitive measures relatively unaffected by sleep deprivation (reasoning or problem-solving). The cash transfer appears to have alleviated financial concerns amongst household heads, who are responsible for satisfying the daily necessities of the household, improving their sleep quality. Immediately after disbursement, eligible households report increases in savings and decreases in outstanding loans. Eligible household heads also report feeling less worried, frustrated, and tired. These patterns are not observed for household heads ineligible for the cash transfer, which suggests that our results are not driven by seasonal confounders or aggregate shocks. These results are also not observed for other members of eligible households, who are not responsible for satisfying the households' financial needs. We also show that nutrition, time in bed, and labor supply are unlikely to explain our results.

JEL codes: I1, I15, I32, O12

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1 Introduction

Evidence from public health, sleep medicine, and economics suggests that the poor get less sleep than those with more money. This is not due to a lack of trying but because of poor sleep quality: the poor experience difficulty falling asleep and staying asleep (Grandner et al. 2010; Patel et al. 2010). In the US, lower-income individuals spend 8 hours in bed but sleep for only 5.5 hours, while higher-income individuals spend 7.5 hours in bed and sleep for 6.5 hours; lower-income individuals experience longer sleep latency (time to sleep onset) and lower sleep efficiency (sleep per time in bed) compared to people with higher incomes (Lauderdale et al. 2006). Similarly, the urban poor in India sleep for only 5.5 hours, despite spending 8 hours in bed, due to frequent awakenings during the night (Bessone et al. 2021; Rao et al. 2021).

Because sleep is an important input for attention, memory, and health (Killgore 2010; Lim and Dinges 2008; Banks and Dinges 2007), there is concern in the popular press and scientific community about a negative feedback loop where mental burdens associated with poverty, such as anxiety and worries, create reasons to toss and turn, which in turn keeps the poor poor (Resnick 2015; Ellison 2021). However, there exists no evidence for a causal relationship between financial concerns and sleeplessness, a precondition to the existence of any such tragic spiral.

Estimation of this relationship is complicated. One, although data sets frequently measure time in bed, they rarely measure sleep quality. Two, economic conditions are typically endogenous. Factors such as employment, education, and health status are correlated with both financial well-being and sleep quality. Therefore, even though there exists a robust positive correlation between economic conditions and sleep quality in both developed and developing countries (Figure 1), its causality remains unclear. Lastly, even if economic conditions are exogenous, it is difficult to parse the effects of mental burdens from the effects of material deprivations like hunger.

In this paper, we leverage a unique natural experiment in Indonesia to solve these complications, and present the first causal evidence for the psychological impacts of financial concerns on sleeplessness. A nationwide household survey collected detailed sleep quality data, coincidentally, just before the unanticipated announcement and disbursement of an unconditional cash transfer for some eligible households and just after the cash infusion for other similar eligible households.

This setup allows us to use a regression discontinuity design to compare outcomes between eligible households surveyed immediately before and after the start of the cash disbursement, isolating the effects of the immediate reduction in financial concerns that are unconfounded by the effects of the more gradual improvements in human capital, physical capital, or nutrition. We find that right after the cash disbursement begins, eligible households report an uptick in savings and a reduction in outstanding loans. As a result, the heads of these eligible households express less worry and frustration, and they are less likely to experience trouble falling asleep or staying asleep. Lastly, these household heads perform better on cognitive indicators sensitive to sleep deprivation but not on cognitive measures relatively unaffected by sleep deprivation.

On Monday, November 17, 2014, Indonesia abruptly announced that eligible households could use their social protection cards to retrieve cash equal to IDR 400,000 (roughly USD 30) as part of an unconditional cash transfer program called the Bantuan Langsung Sementara Masyarakat (BLSM).[1] Coincidentally, the transfer took place in the middle of the administration of a nationwide household survey, the Indonesian Family Life Survey (IFLS 5). The IFLS 5 collected detailed sleep quality data – via a ten-item questionnaire from the Patient Reported Outcomes Measurement Information System (PROMIS) – for the past 7 days for all household members over 15 years of age. The PROMIS sleep items have been validated against other well-known sleep indices (Yu et al. 2012; Buysse et al. 2010; Cella et al. 2010), as well as objective actigraphy sleep measures (Giordano et al. 2022; Hanish, Lin-Dyken and Han 2017; Sletten et al. 2018). We use all ten items to construct an aggregate sleep quality index (SQI). In our analysis, we examine impacts on this aggregate index, as well as on each of its component parts.

Using a regression discontinuity research design, we find a sharp and statistically significant increase in BLSM transfer receipt immediately after the cash transfer announcement and start of disbursement, November 17, 2014, for likely eligible (cardholders) households.[2] Indeed, eligible

[1]The poorest Indonesian households were targeted to receive this cash transfer. Households would have to use their social protection cards (Kartu Perlindungan Sosial, Kartu Keluarga Sejahtera, or Kartu Simpanan Keluarga Sejahtera) to prove their eligibility, and retrieve their BLSM transfers at the nearest post office (The World Bank 2017). In our sample, before the BLSM transfer rollout, IDR 400,000 represented roughly 25 percent of monthly expenditures for the median recipient household.

[2]Because ownership of social protection cards proves eligibility for BLSM as well as other social assistance programs,

cardholder households retrieved the cash transfer at a rapid pace until roughly 50% of cardholder households reported BLSM transfer receipt within just three weeks of the announcement.[3] Correspondingly, we find cardholders household heads surveyed just after the start of the cash transfer disbursement reported significantly better sleep quality (0.4 sd), compared to cardholders household heads surveyed just before the start of the cash disbursement.[4] Kahneman and Krueger (2006) pinpoint sleep quality as a dominant factor in life satisfaction, topping both income and education with a robust 0.29 correlation. Their estimates suggest a permanent improvement in sleep quality of 0.4 standard deviations would predict higher measures of life satisfaction by 0.12 standard deviations. Improvement in sleep quality for cardholder household heads is observed for items in both the sleep disturbance (e.g., 'had difficulty falling asleep' or 'had trouble sleeping') and sleep-related impairment (e.g., 'had a hard time concentrating because of poor sleep' or 'felt irritable because of poor sleep') indices.

This improvement in reported sleep-related impairment is also reflected in cardholder household heads' cognitive performance for indicators that – per the sleep medicine literature – are sensitive to sleep deprivation; there is no improvement on cognitive measures that are relatively unaffected by sleep deprivation. Specifically, we find that cardholder household heads' tested immediately after the start of the cash transfer disbursement displayed improved memory performance (0.2 sd). We also find that cardholder household heads surveyed after the cash transfer disbursement were more likely to be assessed by surveyors as having excellent attention during the survey administration. However, we fail to find evidence for improvement in mathematical problem-solving or reasoning performance. These results are consistent with evidence from sleep medicine that emphasizes the impacts of sleep loss on attention and memory rather than reasoning and problem solving, which are relatively unaffected by sleep deprivation (Lim and Dinges 2008;

we can only identify households *likely* eligible to receive the BLSM transfer.

[3]We cannot disentangle the announcement effect from the effect of actual cash receipt. While the cash transfer was announced and began disbursal on November 17, 2014, the exact timing of disbursement to *each* post office is unknown. Additionally, households might have delayed collection to arrange transport – since two-thirds of post offices are located outside the village, and the median cost for one-way travel is roughly IDR 4,000 – or plan the transfer's use, such as repaying loans.

[4]This effect size is smaller than the effect of regular exercise on a sleep quality index based on the Pittsburgh Sleep Quality Questionnaire (0.74 sd), but comparable to the effects of regular exercise on actigraphic measures of sleep quality: sleep latency (0.35 sd) and sleep efficiency (0.30 sd) (Kredlow et al. 2015).

Killgore 2010; Lim and Dinges 2010; Killgore and Weber 2014).[5]

Improvement in sleep quality is also not driven by differences in characteristics of households surveyed on either side of the cash disbursement: households surveyed before and after the start of the cash transfer disbursement were statistically the same on numerous socioeconomic indicators. Our results are also not driven by seasonal confounders (e.g., temperature) or aggregate shocks (e.g., inflation): we find no difference in sleep quality after the cash transfer disbursement for heads of households ineligible (non-cardholders) for the cash transfer program, not even for non-cardholder household heads who are similar to cardholder household heads.

It is important to note that the stated objective of the BLSM transfer was to offset the price hikes in fuel, food, and transport for the poorest households following cuts in fuel subsidies, also announced on November 17, 2014. This raises two complications: (i) the observed effects might represent a *substantial* lower bound for cardholder household heads, and (ii) non-cardholder household heads might not serve as an ideal control group since they faced price increases without any compensation. To address these points, we note that the additional monthly expenditures incurred from reduced fuel subsidies amount to IDR 46,000 for the median cardholder household. This is just 11.5% of the IDR 400,000 transfer and equates to a less than 3% rise in monthly expenditures.[6] Therefore, the IDR 400,000 transfer is a substantial, immediate, and unconditional liquidity boost. Moreover, there's no detected dip in sleep quality for non-cardholder household heads, regardless of their baseline fuel consumption.

Next, we show that the improvement in sleep quality is observed across demographic subgroups of household heads, irrespective of their age or gender, which suggests that the effects for household heads are not driven by gender- or age-specific physiological, societal, or cultural factors. We also fail to find evidence of improved sleep quality for other members of cardholder households. This suggests that household heads face unique money-related constraints that impede the quality

[5]However, a growing literature in economics suggests that the psychological impacts of economic conditions can have a direct effect on cognitive function. Therefore, we cannot claim that improvement in sleep quality is solely responsible for the improvement in memory performance and attention.

[6]Of course, the IDR 400,000 transfer is intended as a lump sum compensation, not solely for the immediate increase in monthly expenditures observed in the month of the subsidy reduction announcement, but also to mitigate future expected rises in costs. Despite this, the research design employed leverages the immediate, unconditional liquidity boost provided by the transfer. This approach remains pertinent in contexts like ours characterized by frequent consumption smoothing failures.

of their sleep. Indeed, descriptive evidence indicates that household heads' quality of sleep is much more sensitive to socioeconomic status as compared to other members of the household at baseline, even conditional on age and gender (Figure 2). Unlike household heads, other members of the household are unlikely to be responsible for household finances: in the IFLS, the household head is identified by members of the household as the individual *'responsible for satisfying daily necessities of the household or regarded/assigned as the head of the household'*. We hypothesize that the cash infusion relived financial concerns amongst cardholder household heads, improving their sleep quality. Such an explanation is also consistent with evidence from psychology, public health, and sleep medicine that shows that financial strain is a significant correlate of both sleep onset and sleep continuity (Hall et al. 2008, 2009; Perales and Plage 2017; Zheng et al. 2012; Warth et al. 2009). In fact, in a survey of over 2,000 adults in the U.S. in 2022, 87% of respondents say that they have 'lost sleep' due to worries about finances (The American Academy of Sleep Medicine 2022).

To test this hypothesis, we explore how cardholder households' savings and borrowings respond to the unconditional cash transfer. We find that cardholder households surveyed just after the BLSM cash disbursement report an increase in contributions to informal microfinance groups (arisan) as well as an increase in total savings; they also report a decrease in outstanding loans. Cash infusion may have thus helped shore up cardholder households' financial positions, and improved their ability to handle potential emergencies that require immediate access to cash (e.g. illness) (Dupas and Robinson 2013; Breza and Chandrasekhar 2019). In addition, loan repayment may have reduced harassment or humiliation during interactions with moneylenders or with relatives who lent money (Kaur et al. 2022). Overall, the cash disbursement could reduce cardholder household heads' feelings of vulnerability and anxiety, improving their sleep quality. Experimental evidence from India and survey evidence from the U.S. shows that workers feel more financially secure immediately after wages are paid out (Kaur et al. 2022; Pew Charitable Trusts 2016). Such an explanation is also consistent with sleep survey results from a representative sample of U.S. adults: respondents who rated their sleep as excellent are nearly two times more likely to regularly save for retirement or unforeseen medical expenses compared to those who rated their sleep as poor (The Better Sleep Council 2019). Indeed, we find that cardholder household heads, but not

other members of cardholder households, were significantly less likely to report feeling worried (7 percentage points) and frustrated (6 percentage points) after the cash transfer disbursement. Cardholder household heads were also significantly less likely to report feeling tired (9 percentage points) after the cash transfer disbursement.

Lastly, we show that the aggregate effects on sleep quality, attention, memory, savings, borrowings, and worry hide reassuring heterogeneous impacts by neediness: The needier cardholder households – who are much more likely to be in debt – were less likely to report any outstanding loans following the cash transfer disbursement, while the least needy households were more likely to report any savings. Overall, the needier cardholder households reported a larger decrease in outstanding loans and a smaller increase in total savings while the least needy households reported a larger increase in total savings and a smaller decrease in outstanding loans. Furthermore, we find that the improvement in sleep quality, memory, and attention, as well as the decrease in worry, immediately after the start of cash disbursement, is largest for the neediest households, who are also more likely to receive BLSM transfers.

Overall, our results are consistent with the explanation that reduced financial concerns – likely through psychological channels – improved sleep quality.

We rule out several alternative explanations. For instance, it is unlikely that changes in material possessions like communal sleeping aids (e.g. electric fans) are responsible for our results, unless these or similar personal sleeping aids (e.g. a personal bed) were purchased solely for the consumption of the household head. We also fail to find any direct evidence of any sleeping aid purchases after the cash transfer. Such an explanation is also inconsistent with Bessone et al. (2021) who conducted a randomized controlled trial with poor adults in India and showed that sleeping aids increased time in bed but had no effect on sleep efficiency. Our results are also unlikely to be driven by changes in nutrition unless, again, only the household head experienced changes in nutrition. To confirm this, we examine household food consumption in the past week and fail to find evidence for an increase or decrease in food consumption for cardholder households surveyed after the cash transfer disbursement; we also fail to observe any changes in the frequency of meals consumed by cardholder household heads. It is also unlikely that changes in time use for cardholder

household heads after the cash disbursement explain our results. There is no evidence for changes in work hours in the past week for cardholder household heads which suggests that longer or shorter work hours are not responsible for our results; nor do we find evidence for earlier bedtimes or later wake-up times which suggests improvement in sleep quality is not due to increased time in bed or changes in their sleeping schedules. In fact, because cardholder household heads were less likely to report that they 'had difficulty falling asleep' or 'had trouble sleeping', the null effect for time in bed suggests that time asleep increased as well. Finally, it is extremely unlikely that our results are driven by demand characteristics or hawthorne effects, or reflect halo reporting effects of cash transfer receipt. One, we find no effects on affect that would likely be impacted by halo or demand effects (e.g., happiness or enthusiasm). Two, we detect improvement for objective as well as surveyor-measured cognitive indicators that are sensitive to sleep deprivation. Three, we find no effects on sleep quality for other members of cardholder households; it is unlikely that any halo reporting effects of cash transfer receipt would be concentrated amongst household heads.

Related Literature and Contributions. This paper contributes to the growing literature on the psychological impacts of economic conditions (Haushofer and Fehr 2014; Schilbach, Schofield and Mullainathan 2016). Studies have focused on effects on happiness or mental health (Ridley et al. 2020; Haushofer and Shapiro 2016, 2018), cognition and decision-making (Mullainathan and Shafir 2013; Mani et al. 2013; Shah, Shafir and Mullainathan 2015; Carvalho, Meier and Wang 2016; Bartos et al. 2018; Ong, Theseira and Ng 2019; Fehr, Fink and Jack 2022; Lichand and Mani 2019),[7] children's test scores (Duquennois 2022), human capital investments (Lichand et al. 2021), and worker productivity (Kaur et al. 2022).

Our work provides the first evidence for the psychological impacts of economic conditions on the quality of sleep – the single largest use of time. We know extremely little about why the poor do not invest more in high-return sleep (Rao et al. 2021). Is it due to the unrelenting work schedules set by employers in the informal sector, where the poor are overwhelmingly employed (Walch, Cochran and Forger 2016)? Or is it because the poor underestimate the value of sleep and/or that

[7]Carvalho, Meier and Wang (2016) is an exception in that they fail to find evidence that financial strain impedes cognitive function and decision-making among low-income individuals in the US.

they do not have the necessary information to overcome sleep barriers, like college students in the U.S. (Avery, Giuntella and Jiao 2022)? Or perhaps because the returns to time in bed are lower for the poor since they have to spend more time in bed than the rich to get the same amount of sleep due to the lower quality of their sleep (Bessone et al. 2021). Consistent with the last explanation, our results suggest that the poor are unable to invest more in sleep due to, at least partially, the psychological impacts of financial concerns on sleep quality.[8]

This paper also contributes to the literature that examines the impacts of sleep deprivation. An enormous body of research, almost exclusively from rich countries, shows that sleep deprivation is negatively associated with mental health (Scott et al. 2021), attention, memory, and physical health (Killgore 2010; Lim and Dinges 2008; Banks and Dinges 2007), children's test scores (Carrell, Maghakian and West 2011), and worker productivity (Gibson and Shrader 2018). However, similar evidence from low-income countries is extremely limited (Bessone et al. 2021; Jagnani 2022). In fact, Bessone et al. (2021) conducted a field experiment with low-income adults in India that provided information, encouragement, and improvements to home sleep environments. This increased sleep duration by 27 minutes a night by inducing more time in bed, but had no detectable effects on cognition, productivity, decision making, or well being. They speculate that low-quality sleep in their setting may not offer the same marginal benefits as the sleep typically available in higher-income contexts, and underline the need to test interventions that target sleep quality in similar lower-income settings (Rao et al. 2021). Our results suggest that their conjecture is well founded: we present the first evidence that improving sleep quality enhances cognitive functions sensitive to sleep duration amongst lower-income adults in developing countries.

[8]Of course, we do not have data on time asleep or sleep efficiency. However, our results that the cash transfer disbursement decreased the likelihood that cardholder household heads 'had difficulty falling asleep' or 'had trouble sleeping', but had no impact on time in bed, suggest that time asleep and sleep efficiency improved as well. Additionally, we detect significant improvement in cognitive indicators associated with sleep deprivation, but not for cognitive measures that are relatively unaffected by sleep deprivation. Finally, the US data also suggests that individuals with better sleep quality get more sleep (Figure A1).

2 Context and Data

To examine the causal effect of financial concerns on sleep quality, we exploit the rapid dissemination of an unconditional cash transfer program in Indonesia starting November, 17, 2014, in the middle of the rollout of a nationwide household survey that collected detailed sleep quality data.

2.1 Bantuan Langsung Sementara Masyarakat (BLSM)

Over the past decade, Indonesia has reduced existing fuel subsidies and compensated the poorest households for the subsequent rise in fuel, food, and transport prices through an unconditional cash transfer program, the Bantuan Langsung Sementara Masyarakat (BLSM).[9]

In this paper, we study the BLSM transfers that followed the reduction of fuel subsidies in 2014. On Monday, November 17, 2014, in an abrupt announcement, President Joko Widodo raised subsidized gasoline prices by around 30 percent and diesel prices by around 36 percent, effective immediately (Shaffer 2014).[10] Concurrently, it was also announced that eligible households could use their social protection cards (Kartu Keluarga Sejahtera, Kartu Simpanan Keluarga Sejahtera, or Kartu Perlindungan Sosial) to prove their eligibility, and retrieve IDR 400,000 (roughly USD 30), about 25 percent of the monthly expenditures for the median recipient household, at their nearest post office (The World Bank 2017; Stefanie 2014).[11] Simple calculations suggest that the subsequent increase in monthly expenditures due to the reduction in fuel subsidies were about IDR 46,000

[9]While BLSM-targeted households consume little fuel directly, fuel price increases can be passed on to other economic sectors, especially food and transport, which account for significant shares of expenditure. For instance, for an earlier subsidy cut that occurred in June 2013, average fuel prices increased by 33 percent. The value of these subsidies, for poor and near-poor households, has been estimated as slightly less than 10 percent of total consumption expenditures. Therefore, as compensation, the BLSM program transferred cash amounts equal to roughly 11 percent of the regular expenditures of the poorest quarter of households' budgets to these households (The World Bank 2017).

[10]However, soon after, due to falling world oil prices, the Indonesian government decreased fuel prices on two separate occasions in January such that by January 19, 2015, gasoline and diesel prices were only 1.5% and 16%, respectively, above the levels on November 16, 2014. Correspondingly, inflation rate increased from 4.83% in October 2014 to 6.23% in November and 8.36% in December, before decreasing to 6.96% in January 2015. Overall, in this instance, the reduction in fuel subsidies was not accompanied by substantial price increases, and economic growth in the fourth quarter of 2014 or in the first quarter of 2015 was not significantly affected (Bank Indonesia 2015; International Institute for Sustainable Development 2015).

[11]The administrative divisions of Indonesia are structured from the provincial level, followed by the district, subdistrict, and finally the village level. According to IFLS 5, about two-thirds of post offices across Indonesia are located outside the village, and the median cost for one-way travel is roughly IDR 4,000.

or 11.5 percent of IDR 400,000 for the median cardholder household.[12] Therefore, IDR 400,000 represented a sizeable, immediate, and unconditional transfer of liquidity to recipient households.

2.2 The Indonesian Family Life Survey (IFLS)

Importantly, for our research design, the November 2014 transfers coincided with the administration of the fifth survey wave of the Indonesian Family Life Survey (IFLS 5). The IFLS is a longitudinal data set that includes five waves of detailed household surveys conducted by the RAND Corporation (a US-based non-profit) between 1993 and 2015. It covers 13 of the 27 provinces that existed in Indonesia in 1993, and is representative of 83% of the population. The IFLS 5 was administered to 15,185 households composed of 55,935 individuals between September 2014 and April 2015. Figure A2 plots the temporal distribution of all the IFLS 5 household surveys by date. Administration of the survey started on August 25 and was in full swing by November 17, the start of the BLSM transfer disbursement. Furthermore, a simple eyeball test suggests that there was no discontinuous increase or decrease in the frequency of household surveys at the start of the cash transfer disbursement.

Sleep quality and time-in-bed data. The IFLS 5 includes detailed data on sleep quality for the past 7 days for all household members over 15 years of age. That is, the IFLS 5 includes a sleep questionnaire that incorporates 10 items from the Patient Reported Outcomes Measurement Information System (PROMIS): 5 items each from the sleep disturbance and sleep-related impairment item banks, respectively. The PROMIS sleep items have been carefully developed and evaluated against other well-known sleep indices such as the Pittsburgh Sleep Quality Index and the Epworth Sleepiness Scale, as well as by comparing sleep disturbance and sleep-related impairment scores from subjects with and without sleep disorders (Yu et al. 2012; Buysse et al. 2010; Cella et al. 2010). Importantly, they have also been validated against objective actigraphy sleep measures like sleep

[12]Monthly fuel expenditure for the median cardholder household before November 17, 2014, was roughly IDR 30,000; the corresponding number for the median non-cardholder household was IDR 36,000. The fuel subsidy cut would thus represent an increase of IDR 10,000 in monthly fuel expenditure for the median cardholder household and IDR 12,000 for the median non-cardholder household. The subsequent price increases in food and other non-food items – as captured by the rise in inflation between November-January – represented an increase of IDR 36,000 in monthly expenditures for the median cardholder household and IDR 48,000 for the median non-cardholder household.

latency and sleep efficiency (Giordano et al. 2022; Hanish, Lin-Dyken and Han 2017; Sletten et al. 2018).[13] We use all ten items to construct an aggregate sleep quality index (SQI). In our analysis, we examine impacts on this aggregate index, as well as on its component parts. The IFLS 5 also includes data on bedtime and wake-up time for the day prior to the survey for every member of the household, which allows us to infer time spent in bed (but not sleep quantity).[14]

Expenditure, affect, and cognition data. In addition to these sleep data, the IFLS 5 collected detailed household data on food consumption in the past 7 days, including information on the frequency of meals consumed by household members, expenditures on recurring non-food items during the past month, expenditures on sporadic non-food items during the past year, and the current value of assets and liabilities.

The survey also collected, for all household members over 15 years of age, data on three positive (happiness, contentment, enthusiasm) and nine negative (worries, frustration, sadness, stress, pain, bored, loneliness, anger, tiredness) affect for the previous day, and on mental health for the past 7 days via the Center for Epidemiological Studies' ten-item depression scale (CES-D).

The IFLS 5 also includes several different measures of cognition for all household members over 15 years of age: performance on eight Raven's Matrices and a six-item block-adaptive number series test (reasoning), performance on five mathematical questions (problem solving), and the ability to recall a list of ten words twice – once immediately after hearing them, and then once more after the administration of a separate portion of the questionnaire (memory). Lastly, the IFLS 5 also recorded surveyors' assessment of all respondents' attentiveness during the survey. These data

[13] For instance, Giordano et al. (2022) collected data from 17 predominantly male participants (average age = 38.8) in the US using actigraphy devices and self-reported PROMIS item banks the week prior to and after orthopaedic surgery; they show that prolonged wake after sleep onset measured by actigraphy was strongly correlated with increased PROMIS sleep disturbances (r_s = 0.49; p-value = 0.045). Similarly, Hanish, Lin-Dyken and Han (2017) show that in a cohort of 25 healthy adolescents in the US, total sleep time measured by actigraphy was strongly correlated with PROMIS sleep disturbance (r_s = -0.46; p-value = 0.02), and sleep-related impairment (r_s = -0.46; p-value = 0.02) scores. Lastly, Sletten et al. (2018) conduct a randomised, placebo-controlled, double-blind clinical trial in Australia where 116, roughly equal number of male and female (average age = 29.0), clinically diagnosed patients with Delayed Sleep-Wake Phase Disorder (DSWPD) were assigned to 4-week treatment with 0.5 mg fast-release melatonin or placebo 1-hour before desired bedtime for at least 5 consecutive nights per week. They show that relative to baseline and compared to placebo, actigraphic sleep onset occurred 34 min earlier in the melatonin group, and both PROMIS sleep disturbance and sleep-related impairment scores significantly decreased. Unfortunately, we are not aware of any studies that validate objective actigraphy sleep measures against self-reported PROMIS sleep disturbance and sleep-related impairment scores in lower-income contexts like Indonesia.

[14] While time use data collected by the IFLS 5 is limited, respondents are asked about hours worked in the past week.

were recorded twice, once after the first questionnaire, which takes about an hour, and includes the 12-item affect module, and then once again after the second questionnaire, which takes another hour, and includes the 10-item sleep module.

BLSM transfers data. The survey also collected detailed information on BLSM transfers, including the month of receipt and amount of transfers. Information on whether the household has any of the social protection (SP) cards required to claim BLSM transfers is also recorded. Unfortunately, because ownership of social protection cards proves eligibility for BLSM as well as other social assistance programs, we can only identify households *likely* eligible to receive BLSM transfers. Nonetheless, together these data allow us to i) identify the precise month households report receipt of BLSM transfers, ii) verify that households that do not have social protection cards (ineligible households) did not receive BLSM transfers, and critically, iii) identify households who have social protection cards and are thus likely eligible for the BLSM transfer even though they were interviewed prior to the transfer disbursement date.

3 Research Design: Regression Discontinuity

Figure A3 plots the likelihood of BLSM transfer receipt and the mean BLSM transfer amounts received in Fall 2014 by interview date. As one might expect, we find that few likely eligible households (cardholders) interviewed prior to November 17, the beginning of the BLSM transfer disbursement, reported receipt of a BLSM transfer. This was followed by a continuous and rapid increase in BLSM transfer receipt in the subsequent three weeks amongst cardholder households. This trend stabilized by December 7 with roughly half of the cardholder households reporting receipt of a BLSM transfer.[15] In that week, the average cardholder household reported BLSM transfers totalling roughly IDR 200,000. Overall, 81 percent of recipient households reported

[15]We cannot distinguish when the transfer was available to the household versus when the household retrieved it. That is, although we know that both the cash transfer announcement and start of disbursement was on November 17, 2014, and that the transfers were likely disbursed by the government to *all* post offices by December 7, we do not know when the transfers were disbursed to *individual* post offices. Furthermore, eligible households may have collected the transfer with a slight lag once it was made available, after making transportation arrangements and/or arrangements for its use (e.g., loan repayment). Importantly, all of this also means that we cannot disentangle the announcement effect from the effect of actual cash receipt.

transfers of IDR 400,000 (about USD 30), representing roughly 25 percent of the median monthly expenditures for cardholder households interviewed prior to the transfer disbursement. The average BLSM transfer amount amongst recipients was roughly IDR 380,000. Reassuringly, less than 1 percent of ineligible households (non-cardholders) reported receipt of a BLSM transfer before or after November 17.

To examine the causal effects of financial concerns on sleep quality, we use a regression discontinuity design that leverages the start of the BLSM transfer disbursement, November 17, 2014:

$$Y_{ihekd} = \gamma_0 + \gamma_1 \mathbf{1}(Date_{ihek} \geq T) + \gamma_2 (Date_{ihek} - T) + \\ + \gamma_3 (Date_{ihek} - T) * \mathbf{1}(Date_{ihek} \geq T) + \boldsymbol{\theta} \mathbf{X_{ihek}} + + \rho_k + \nu_{ihekd} \tag{1}$$

Y_{ihekd} is the outcome of interest (sleep quality, cognitive measures, affect) for individual i in household h in enumeration area e in kabupaten (district) k on survey date d. Our outcomes of interest also include household-level expenditures, assets, and liabilities (Y_{hekd}).[16] $Date_{ihek}$ indicates the date on which individual- and household-level outcomes were recorded,[17] while T is the treatment threshold (November 17). Figure A4 shows the density of the survey week distribution is continuous across the treatment threshold; the McCrary test statistic for cardholder household heads is 0.07 (s.e. 0.11) (McCrary 2008). We include a vector of individual or household characteristics, $\mathbf{X_{ihek}}$, as controls, although excluding these controls does not alter our results appreciably. Specifically, we control for age (flexibly in decade bins) and gender for individual-level outcomes, with an additional control for years of schooling for individual-level cognitive measures. We control for household size and composition for household-level outcomes.[18] ρ_k are kabupaten (district) fixed effects. Thus, the RD estimates compare outcomes for individuals or households within the same district but surveyed on either side of the treatment threshold. Standard errors are

[16]The IFLS randomly selected 321 enumeration areas in 13 of Indonesia's 26 provinces containing 83% of the population.

[17]The individual- and household-level outcomes were recorded via health and household surveys, respectively, which were administered on the same date for almost all households. For the few households where these surveys were administered on different dates, $Date_{ihek}$ indicates the health survey date for individual-level outcomes and the household survey date for household-level outcomes.

[18]That is, for household-level outcomes, we include controls for total number of household members, number of household members under 16 years of age, number of household members over 65 years of age, number of female household members, and the gender of the household head.

clustered at the enumeration area level.

Analysis sample. Our analysis sample includes 18,348 individuals from 7,739 households. Of these, 1,788 households have a social protection card (likely eligible households), while 5,951 do not have a social protection card (ineligible households). Therefore, at the individual level, our sample includes 1,788 cardholder and 5,951 non-cardholder household heads. The corresponding numbers for other members of the household are 2,741 and 7,868, respectively. To construct this analysis sample we restrict the sample to households where (i) the household head answered the 10-item questionnaire on sleep quality and (ii) the household survey, interview with the household head, and interviews with other household members, all occurred within 3 months (90 days) before or after November 17, 2014 – the beginning of the BLSM transfer disbursement. We impose these restrictions to ensure that we compare the same set of households, household heads, and other household members across all outcomes of interest. Furthermore, we show that our results are insensitive to these sample restrictions.

Balance tests. The underlying assumption of our research design is that households surveyed on or just after November 17 are, on average, similar to households surveyed just before November 17. To test this assumption, we examine survey attrition and non-response, ownership of social protection cards based on interview date, and whether households surveyed on either side of the cutoff are similar on observable socioeconomic indicators (Table A1). First, we fail to find evidence that survey participation was differential for those surveyed just before versus just after the cutoff. We also fail to find evidence for non-response to the sleep questionnaire based on interview date. We show that household heads surveyed just after the cutoff are no more or less likely to have responded to the 10-item sleep quality questionnaire than household surveyed just before the cutoff.[19] Second, we show that households surveyed just after the cutoff are no more or less likely to have a social protection card than household surveyed just before the cutoff. Third, both cardholder and non-cardholder households surveyed just after the cutoff are no more or less likely to have

[19]Similarly, other members of the household surveyed just after the cutoff are no more or less likely to have responded to the 10-item sleep quality questionnaire than other members surveyed just before the cutoff.

access to other social protection programs. Fourth, cardholder and non-cardholder households, household heads, and other members of the household, surveyed on either side of the cutoff have similar socioeconomic characteristics. We observe imbalance in household composition and access to health insurance for non-cardholder households. However, the p-value of the joint F-test is 0.21 between non-cardholder households surveyed on either side of the cutoff.

Summary statistics. Table A1 also presents the baseline (pre-transfer) summary statistics for households and household members. The 22% of households that have a social protection card are poorer – as indicated by land value and ownership – than the rest of the sample who do not have a social protection card. Looking towards household members, household heads are older and less likely to be female than other members of the household. Similarly, non-household heads are younger and more likely to be female than the household head.

Correlation between socioeconomic status and sleep quality at baseline. Higher socioeconomic status individuals in Indonesia – as measured by total household assets before the cash transfer disbursement – spend less time in bed but experience better sleep quality (Figure 1, Panel (b); Figure A5, Panel (b)), consistent with data collected via actigraphy monitoring devices from higher- and lower-income individuals in the US and India (Lauderdale et al. 2006; Bessone et al. 2021).[20] Furthermore, although time in bed for both household heads and other household members is equally sensitive to socioeconomic status, household heads spend less time in bed across the socioeconomic spectrum as compared to other household members (Figure A6). Interestingly, household heads' quality of sleep is much more sensitive to socioeconomic status as compared to other members of the household (Figure 2): we observe a strong positive correlation between socioeconomic status and sleep quality for household heads; however, the correlation between socioeconomic status and sleep quality for other household members is not as pronounced. This pattern holds even after controlling for age and gender. Overall, these raw data suggest that household heads face unique money-related constraints that impede the quality of their sleep.

[20]Although we do not observe sleep quantity in the Indonesia data, the US data suggests that higher socioeconomic status individuals also get more sleep (Figure A5, Panel (a)).

Therefore, we present impacts on sleep quality separately for household heads and other members of the household.

4 Results: Impacts of Financial Concerns on Sleeplessness

4.1 First Stage: Transfer Likelihood and Amount

Figure 3 shows the graphical representation of the first stage result. Panel (a) and Panel (c) show the change in likelihood of BLSM transfer receipt at the treatment threshold separately for likely eligible (cardholder) and ineligible (non-cardholder) households, respectively; Panel (b) and (d) show the discontinuity in BLSM transfer amounts at the treatment threshold separately for cardholder and non-cardholder households, respectively. We observe a sharp and statistically significant increase in BLSM transfer receipt at the start of the cash transfer disbursement, November 17, 2014, for cardholder households. Indeed, eligible cardholder households retrieved the cash transfer at a rapid pace such that 50% of cardholder households report BLSM transfer receipt by December 7, a rate that is stable thereafter, with the average cardholder household reporting transfers totalling roughly IDR 200,000. Table 1 shows the corresponding point estimates. Cardholder households surveyed on or just after November 17 are 17 percentage points more likely to report any BLSM transfer receipt. Furthermore, cardholder households surveyed on or just after November 17 report BLSM transfers of IDR 70,000 on average. However, we find no first stage – neither visually nor statistically – for non-cardholder households: few non-cardholder households reported receipt of BLSM transfers before or after the treatment threshold.

4.2 Impacts on Sleep Quality for Household Heads

Figure 4 plots sleep quality – as measured by the aggregate SQI index – before and after the start of the BLSM cash transfer disbursement separately for cardholder and non-cardholder household heads in Panels (a) and (b), respectively. We observe a sharp increase in cardholder household heads' sleep quality following the start of the cash transfer disbursement, with no corresponding

change in sleep quality for non-cardholder household heads. That is, cardholder household heads surveyed on or just after November 17 reported significantly improved sleep quality, compared to cardholder household heads surveyed just before November 17.[21]

Table 2 presents the corresponding reduced form point estimate of 0.4 sd for cardholder household heads.[22] This effect size is smaller than the effect of regular exercise on a sleep quality index based on the Pittsburgh Sleep Quality Questionnaire (0.74 sd), but comparable to the effects of regular exercise on actigraphic measures of sleep quality: sleep latency (0.35 sd) and sleep efficiency (0.30 sd) (Kredlow et al. 2015). Because these effects are not observed for non-cardholder household heads, it is unlikely that our results are driven by seasonal confounders (e.g. changes in temperature). Indeed, we can also reject that the point estimate for cardholder household heads is statistically the same as the point estimate for non-cardholder household heads (p-value < 0.005).

Fuel subsidies. The lack of effects for non-cardholder household heads also suggests that the reduction in fuel subsidies, also announced on November 17, or other aggregate shocks, do not confound the impact of cash transfer disbursement on sleep quality for cardholder household heads.[23] It is unlikely that the fuel subsidy cut had an immediate, direct impact on either cardholder or non-cardholder households for two reasons. First, as discussed in Section 2.1, it only represented a small increase of IDR 10,000 in monthly fuel expenditure for the median cardholder household and IDR 12,000 for the median non-cardholder household. Second, we fail to find evidence for a decrease in sleep quality for non-cardholder household heads irrespective of their fuel consumption at baseline (Table A3).

Seasonal confounds that exclusively affect cardholder household heads. One concern still remains: the null effects for non-cardholder household heads do not rule out the existence of seasonal confounds

[21]The slope of the line capturing cardholder household heads' sleep quality after the treatment threshold suggests that the improvement in sleep quality was short-lived, returning to baseline levels roughly three months after the start of the cash transfer disbursement. However, it is important to note that, like with any regression discontinuity research design, we cannot attach a causal interpretation to patterns of results away from the treatment threshold.

[22]Our regression discontinuity estimates are insensitive to bandwidth choice (Figure A7). They are also robust to the relaxation of sample restrictions described in Section 3 (Table A2). Finally, we conduct a placebo test where we run 1000 iterations of Equation 1 by randomly assigning household heads' interview dates for each iteration. Inspections of the resulting distribution of point estimates can help test the appropriateness of our statistical model and the likelihood that our results are an artifact of chance or of a systematic structure in the data. Indeed, the distribution of point estimates indicates that less than 1 percent of these estimates are larger in magnitude than the actual coefficient (Figure A8).

[23]In any case, the reduction in fuel subsidies, would introduce downward bias in our estimates for cardholder household heads.

that exclusively affect cardholder household heads. To address this concern, we examine impacts on sleep quality for non-cardholders household heads who are similar to cardholder household heads. Specifically, we examine impacts on sleep quality for non-cardholder household heads who i) are eligible for other social protection programs and ii) are needier, like cardholder household heads.[24] Reassuringly, we fail to find evidence for an improvement in sleep quality for these two subsets of non-cardholder household heads (Table A4).

Next, we show that reported improvement in sleep quality for cardholder household heads, and the corresponding lack of effect for non-cardholder household heads, is observed for both the sleep disturbance and sleep-related impairment indices (Table 3).

Sleep disturbance index. Cardholder household heads surveyed on or just after November 17 reported a statistically significant 0.34 SDs decrease in their aggregate sleep disturbance scores (Table 3, Panel (a)). Improvement in sleep disturbance for cardholder household heads is observed for each of the five items that together constitute the sleep disturbance index (Table 3, Panel (b)). However, the signal is quantitatively strongest for two of these items: household heads surveyed just after the cash transfer disbursement were significantly less likely to report that they 'had difficulty falling asleep' and 'had trouble sleeping'. This is consistent with actigraphy data from the US and India that shows that the poor have difficulty falling asleep and staying asleep (Lauderdale et al. 2006; Bessone et al. 2021). We fail to find these effects for non-cardholder household heads. The point estimate is small, positive, and statistically insignificant. In fact, we can reject that the point estimate for the aggregate disturbance index for cardholder household heads is statistically similar to the point estimate for non-cardholder household heads (p-value < 0.005).

[24]To generate neediness, we predict ownership of a social protection card – which is necessary to retrieve BLSM transfers – we regress the indicator variable that captures social protection card ownership on household characteristics included in Table A1, Panel (b). We find that eligibility for other social protection programs, and the size and value of farm and non-farm landholdings are significant predictors of social protection card ownership (Figure A10, Panel (a)). Moreover, most cardholder households have predicted values for social protection card ownership ≥ 0.35 (Figure A10, Panel (b)). Therefore, we categorize non-cardholder households with $\mathbb{E}[\textit{has SP card}] \geq 0.35$ as those that have *higher* predicted values for social protection card ownership (medium or high need households).

Sleep-related impairment index. Similarly, cardholder household heads surveyed on or just after November 17 reported a statistically significant 0.37 SDs decrease in their aggregate sleep-related impairment scores (Table 3, Panel (a)). Improvement in sleep-related impairment for cardholder household heads is observed for each of the five items that together constitute the sleep-related impairment index (Table 3, Panel (b)). Here, the signal is quantitatively strongest for four of these items: cardholder household heads surveyed just after the cash transfer disbursement were significantly less likely to report that they 'had a hard time concentrating because of poor sleep', 'had problems during the day because of poor sleep', 'felt tired', and 'felt irritable because of poor sleep'. We fail to find these effects for non-cardholder household heads. The point estimates are close to zero and statistically insignificant. We can also reject that the point estimate for the aggregate impairment index for cardholder household heads is statistically similar to the point estimate for non-cardholder household heads (p-value < 0.005). Overall, while we directly evaluate effects on household heads' cognition using both objective measures as well as surveyors' assessments below, these self-reported results strongly suggest that improvement in cardholder household heads' sleep quality had a positive impact on their cognition in ways that were meaningful to the respondents.

4.3 Impacts on Cognitive Performance for Household Heads

Next, we show that improvement in reported sleep-related impairment is also reflected in cardholder household heads' cognitive performance for indicators that – per the sleep medicine literature – are sensitive to sleep deprivation; there is no improvement on cognitive measures that are relatively unaffected by sleep deprivation (Table 4).[25]

We find that cardholder household heads tested just after the cash transfer disbursement performed better on memory tests, as measured by rapid and delayed word recall (0.18 and 0.19 SDs, respectively) (Table 4, Panel (a)). Furthermore, cardholder household heads' surveyed after the cash transfer disbursement were 5 percentage points (16.32%) more likely to be assessed by surveyors as having excellent attention during the survey (Table 4, Panel (b)). This effect is only

[25]In Figure A9, we show that all cognitive measures included in our analysis, irrespective of whether they are sensitive to sleep deprivation per the sleep medicine literature, are strongly correlated with years of schooling.

observed for the second attentiveness assessment, about two hours into the survey after the second questionnaire, and not the first assessment, which was conducted an hour into the survey after the first questionnaire. The point estimate for the first attentiveness assessment is smaller and statistically insignificant. We can also reject that the point estimate on the first assessment is statistically equal to the point estimate on the second assessment (p-value = 0.05).[26] This pattern of impact on attention is consistent with evidence from lab experiments that show the effect of sleep deprivation on attention increases across the duration of the task (Lim and Dinges 2008; Hudson, Van Dongen and Honn 2020).[27]

We fail to find evidence for an improvement in problem solving, as captured by math questions, or reasoning performance, as elicited by Raven's Matrices and the number series test. The point estimates are small, negative, and statistically insignificant. We can also reject statistical equality between the point estimates for memory tests, and mathematical problem-solving or reasoning tests (p-values $\in$ [0.00, 0.05]). These results are consistent with evidence from sleep medicine that emphasizes the impacts of sleep loss on attention and memory rather than reasoning and problem solving, which are relatively unaffected by sleep deprivation (Lim and Dinges 2008; Killgore 2010; Lim and Dinges 2010; Killgore and Weber 2014).[28] However, because a growing literature in economics suggests that the psychological impacts of economic conditions can have a direct effect on cognitive function,[29] we cannot claim that improvement in sleep quality is solely responsible for the improvement in memory performance and attention.

Finally, in line with our results for sleep quality, we fail to find evidence for improvement

[26]It is important to note that the 10-item sleep questions are part of the second questionnaire. Therefore, it may be that attentiveness ratings on the second assessment are biased upwards because the same surveyor who rates a respondent's attentiveness was just told by the respondent how impaired due to poor sleep they felt. However, such an explanation is unlikely to be responsible for our attentiveness results. The 12-item affect questions which inquire about frustration, worries, and tiredness, impacts on which we discuss in Section 4.4, were part of the first questionnaire. It seems implausible that surveyors' assessments were biased by respondent's answers to the sleep questions, but not by the responses to the affect questions. Nevertheless, we cannot rule out such an explanation completely.

[27]It is extremely unlikely that the improvement in attention for cardholder household heads tested just after the cash transfer disbursement introduces *systematic* bias in their response to the sleep quality or affect questionnaires.

[28]Different types of math problems emphasize different cognitive domains, including attention, memory, and reasoning. Furthermore, the complexity of the problem determines the intensity with which each domain is engaged. Finally, close to 70% of cardholder household heads have six or fewer years of formal schooling. Given this variability and complexity, and limited formal education, one must be cautious not to over-interpret the null results for mathematical problem-solving.

[29]For instance, Kaur et al. (2022) stagger when wages are paid out in a sample of low-income Indian piece-rate manufacturing workers to show that financial concerns lower productivity due to reduced attention.

in memory performance or attentiveness assessment for non-cardholder household heads. The point estimates are much smaller and statistically insignificant. In fact, we can statistically reject that the point estimates for delayed word recall are the same for cardholder household heads and non-cardholder household heads (p-values = 0.04). We can also reject that the point estimates for the second attentiveness assessment for cardholder and non-cardholder household heads are statistically the same (p-value = 0.04). However, we are underpowered to statistically reject equality of point estimates for rapid word recall between cardholder household heads and non-cardholder household heads (p-values = 0.16).

4.4 Mechanisms: Psychological Impacts of Financial Concerns

In this section, we argue that improvement in sleep quality for cardholder household heads is at least partly due to the psychological impacts of reduced financial concerns following the cash transfer disbursement. First, we show that improvement in sleep quality amongst cardholder household heads is observed across demographic subgroups, irrespective of age or gender. Second, we fail to find evidence of improvement in sleep quality for other members of cardholder households, who, unlike household heads, are not responsible for household finances. Third, we show that immediately after the cash transfer disbursement, cardholder households report an increase in savings and a decrease in outstanding loans. Fourth, we show that cardholder household heads report feeling less worried, frustrated, and tired after the cash transfer disbursement. Finally, we fail to find evidence for alternative explanations such as the purchase of sleeping aids, and changes in nutrition or time use.

Sleep quality improved across demographic subgroups of cardholder household heads. We find the improvement in sleep quality amongst cardholder household heads is observed across demographic subgroups, irrespective of age or gender, which suggests that the effects for household heads are not driven by gender- or age-specific physiological, societal, or cultural factors (Table 5, Panel (b)). The point estimate for female household heads is similar to that for male household heads; however, it is noisier likely due to the smaller number of female headed households in our

sample. Household heads over 65 years of age are also less common generating an imprecise, but non-trivial, point estimate of 0.24 SDs. We also fail to reject that the point estimates are the same across household head age groups (p-value = 0.70) and across gender (p-value = 0.91).

No improvement in sleep quality for other members of cardholder households. Importantly, we fail to find evidence of improvement in sleep quality for other members of cardholder households (Table 5, Panel (c)); the point estimate is smaller, positive, and statistically insignificant. We can also reject equality of the point estimates between cardholder household heads and other members of cardholder households (p-value < 0.005).[30] Furthermore, for almost all demographic subgroups discussed above, we can also reject equality of the point estimates between cardholder household heads and other members of cardholder households that share the same demographic characteristics (p-values $\in [0.01, 0.07]$). The only demographic subgroup where we are underpowered to reject equality of the point estimates between cardholder household heads and other members of cardholder households is household members over 65 years of age (p-value = 0.30).[31]

These results suggest that household heads face unique money-related constraints that impede the quality of their sleep. Indeed, descriptive evidence presented in Figure 2, and discussed in Section 3, suggests that as compared to household heads, the correlation between socioeconomic status and sleep quality is much weaker for other members of the household.

In the IFLS, the household head is identified by members of the household as the individual *'responsible for satisfying daily necessities of the household or regarded/assigned as the head of the household'*. Therefore, it may be that the cash infusion relived financial concerns amongst cardholder household heads, improving their sleep quality.[32] Such an explanation is also consistent with evidence from

[30]The negative point estimates for other members of the household, albeit small and statistically insignificant, could be because earlier onset of sleep or decreased wake after sleep onset for household heads after cash transfer disbursement also means earlier onset of snoring or increased episodes of snoring throughout the night which may negatively affect sleep quality for other members of the household (Beninati et al. 1999).

[31]Similarly, we fail to find evidence for improvement in memory performance or attentiveness assessment for other members of cardholder households (Table A5). The point estimates are much smaller and statistically insignificant. However, we are underpowered to reject statistical equality between point estimates for cardholder household heads and other members of cardholder households (p-values $\in [0.27, 0.51]$).

[32]In line with such an explanation, the only demographic group amongst other members of cardholder households for whom we observe an improvement in sleep quality is the one most similar to the average household head: men who are 30 years of age and over, and likely share the responsibility of satisfying daily necessities of the household with the household head. The point estimate for this group is statistically similar to that for household heads (Table A6); however,

psychology, public health, and sleep medicine that shows that financial strain is a significant correlate of both sleep onset and sleep continuity (Hall et al. 2008, 2009; Perales and Plage 2017; Zheng et al. 2012; Warth et al. 2009). In fact, in a survey of over 2,000 adults in the U.S. in 2022, 87% of respondents say that they have 'lost sleep' due to worries about finances (The American Academy of Sleep Medicine 2022).

Savings increased and outstanding loans decreased amongst cardholder households. We examine how cardholder households' savings and borrowings respond to the cash transfer disbursement (Table 6). We find that cardholder households surveyed just after the cash transfer disbursement report a statistically significant 3.03% increase in savings contributions to informal microfinance groups (arisans) in the last month as well as a statistically significant 12.18% increase in total savings just after the cash transfer disbursement.[33] Cardholder households also report a statistically significant 14.27% decrease in outstanding loans just after the cash transfer disbursement.[34]

The increase in total savings is not observed for non-cardholder households: although we are slightly underpowered to reject statistical equality between point estimates for cardholder and non-cardholder households (p-value = 0.15), the point estimate for non-cardholder households is zero and statistically insignificant. Interestingly, however, we observe comparable effects on arisan contributions and outstanding loans for non-cardholder households, perhaps due to peer effects of loan repayments and savings contributions by cardholder households (Breza 2013; Breza and Chandrasekhar 2019).

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it is noisier likely due to the small number of men who are at least 30 years of age amongst non-household-heads.

[33] An arisan is an extremely common form of Rotating Savings and Credit Association in Indonesia, a form of microfinance. It involves a group of people, often friends, neighbors, or family members, who gather on a regular basis (often monthly). Each member contributes a fixed sum of money at each meeting. The total sum of money contributed by all members is then given to one member, and this process repeats until each member has received the pot once. Arisans provide a means of saving and borrowing lump sums of money. This can be particularly useful for people with lower incomes, who might struggle to save significant amounts of money over time.

[34] It is important to exercise caution in interpreting the absolute value of the percentage effects on savings and borrowings: because a significant number of households do not have any savings or borrowings, 81.58% and 60.50%, respectively, and because of the presence of outliers, the absolute value of the percentage effects on savings and outstanding loans are extremely sensitive to whether the outcome variable is defined in logs or levels, as well as to the level of winsorization (Table A7). However, the qualitative interpretation of these estimates is statistically robust to our sensitivity tests. Furthermore, although the point estimates are underpowered, we also document a large extensive margin effect on total savings and outstanding loans: cardholder households surveyed just after the cash transfer disbursement are 4.03 percentage points (22.36%) more likely to have any savings (p-value = 0.33), and 7.58 percentage points (19.19%) less likely to have any outstanding loans (p-value = 0.12).

Lastly, these aggregate effects on savings and borrowings hide reassuring heterogeneous impacts by neediness:[35] The needier (medium or high need) cardholder households – who are much more likely to be in debt – were less likely to report any outstanding loans following the cash transfer disbursement, while the least needy (low need) households were more likely to report any savings (Table A8). Overall, the needier cardholder households reported a larger decrease in outstanding loans and a smaller increase in total savings while the least needy households reported a larger increase in total savings and a smaller decrease in outstanding loans. Furthermore, we find that the improvement in sleep quality, memory, and attention, immediately after the start of cash disbursement, is largest for the neediest households, who are also more likely to receive BLSM transfers.

These results show that the cash infusion may have helped shore up the financial positions of cardholder households, and improved their ability to handle potential emergencies that require immediate access to cash to address (e.g., illness) (Dupas and Robinson 2013; Breza and Chandrasekhar 2019). In addition, loan repayment may have reduced harassment or humiliation during interactions with moneylenders or with relatives who lent money (Kaur et al. 2022). Therefore, the cash disbursement could have reduced cardholder household heads' feelings of vulnerability and anxiety, thereby improving their sleep quality. Experimental evidence from India and survey evidence from the U.S. shows that workers feel more financially secure immediately after wages are paid out (Kaur et al. 2022; Pew Charitable Trusts 2016). Such an explanation is also consistent with sleep survey results from a representative sample of U.S. adults: respondents who rated their sleep as excellent are nearly two times more likely to regularly save for retirement or unforeseen medical expenses compared to those who rated their sleep as poor (The Better Sleep Council 2019).

Worries and frustration decreased amongst cardholder household heads. To provide direct evidence on the role played by psychological factors associated with financial concerns, we examine

[35]To generate neediness, we predict ownership of a social protection card – which is necessary to retrieve BLSM transfers – by regressing the indicator variable that captures social protection card ownership on household characteristics included in Table A1, Panel (b). As mentioned earlier, we find that access to and receipt of other social protection programs, and the size and value of farm and non-farm landholdings are significant predictors of social protection card ownership (Figure A10). We categorize non-cardholder households with $\mathbb{E}[\textit{has SP card}] < 0.35$, ≥ 0.35 & ≤ 0.6, and > 0.6, as low need-, medium need-, and high need households, respectively.

the effects of the cash transfer disbursement on affect (Table 7).

We find that cardholder household heads surveyed just after the cash transfer disbursement were 7 percentage points less likely to report feeling more than a little worried compared to cardholder household heads surveyed just before the cash transfer. This result is consistent with a large literature in psychology and sleep medicine on the association between worries and difficulty falling asleep, poorer sleep quality, and shorter sleep duration, in both clinical and non-clinical samples (Harvey, Tang and Browning 2005; Harvey 2005; Clancy et al. 2020; Pillai and Drake 2015). Furthermore, we find small, positive, and statistically insignificant effects for worries for non-cardholder household heads as well as other members of cardholder households. We can reject statistical equality between the point estimates for cardholder and non-cardholder household heads (p-value = 0.02); however, we are slightly underpowered to reject that the point estimates for cardholder household heads and other members of cardholder households are statistically the same (p-value = 0.11).

We also find that cardholder household heads surveyed after the cash transfer disbursement were 6 and 9 percentage points less likely to report feeling more than a little frustrated and tired, respectively. The effect on tiredness for cardholder household heads is in line with the decrease in reports of 'feeling tired' as part of the sleep-related impairment index. Moreover, the effect on frustration is consistent with evidence in psychology that suggests that frustration is a predictor of poor sleep quality (Niemiec et al. 2020; Uysal and Ascigil 2022; Balter, Sundelin and Axelsson 2021). Like for worries, we also find null effects for frustration and tiredness for non-cardholder household heads as well for as other members of cardholder households after the cash transfer disbursement. The effects are much smaller and statistically insignificant. We can also reject statistical equality between the point estimates for these groups for frustration (p-values $\in$ [0.02, 0.03]) and tiredness (p-values $\in$ [0.01, 0.07]).[36]

We fail to find statistically significant impacts for stress, anger, happiness, sadness, enthusiasm, contentment, boredom, loneliness or pain amongst cardholder household heads. The point

[36]These results are also consistent with pre-transfer (baseline) correlations observed in the data: household heads who are more than a little worried, frustrated, or tired have worse sleep quality (Figure A11).

estimates for sadness, enthusiasm, boredom, happiness, anger, and stress are close to zero.[37] The coefficient for pain is negative, as one might expect.[38] The point estimate for loneliness is positive while the point estimate for contentment is negative.[39]

Lastly, we examine effects on mental health for the past 7 days as measured by the CES-D ten-item depression scale (Table A9). We find that the depression index of cardholder household heads surveyed just after the cash transfer disbursement is lower than that of cardholder household heads surveyed just before the cash transfer (-0.14 SDs). However, the point estimate is statistically insignificant.[40]

Overall, our pattern of results are consistent with the explanation that improvement in sleep quality for cardholder household heads is at least partly driven by the psychological impacts of reduced financial concerns following the cash transfer disbursement. It is important to note that we cannot, and neither is it our aim, to isolate any particular psychological mechanism; several – including worries, frustration, or pain – may involuntarily interfere with sleep quality.

Alternative explanations. The concentration of our estimates amongst cardholder household heads, with null effects for non-cardholder household heads as well as for other members of cardholder households, rules out alternative explanations that would influence both non-cardholder and cardholder households (e.g. temperature) and channels that would likely impact multiple members of cardholder households (e.g. sleeping aids like electric fans). In this section, we discuss whether changes in physical circumstances that are specific to the cardholder household heads could plausibly explain our finding of improved sleep quality immediately after the cash transfer

[37] Worry involves persistent negative thinking about potential adverse events or uncertainties – e.g., thinking about an uncertain situation like being unable to pay for emergency medical expenses. Stress, in contrast, is the body's physical reaction to an external event. When such stress is ongoing, as with persistent financial problems, the body remains in a constant state of alert (Pattee 2020). Therefore, one interpretation of our results is that while the BLSM transfer eases financial uncertainty temporarily, alleviating short-term financial worries, it does not appear to mitigate long-term financial stress.

[38] We also cannot reject that the point estimate for pain is statistically the same as the point estimate for worries (p-value = 0.82) or frustration (p-value = 0.97) or tiredness (p-value = 0.43).

[39] We can reject that these coefficients are statistically the same as the estimate for worries or frustration or tiredness (p-values $\in$ [0.02, 0.04].

[40] We find positive (worse mental health) and significant effects for non-cardholder household heads. We can also reject that the point estimates between cardholder and non-cardholder household heads for CES-D depression index is statistically the same (p-value = 0.01). The point estimate for other members of cardholder households is closer to zero and statistically insignificant.

disbursement. We also argue that demand effects (response bias) cannot explain our results.

Sleeping aids. It is unlikely that changes in material possessions like communal sleeping aids (e.g., mosquito repellents, electric fans) are responsible for our results, unless, perhaps implausibly, these or similar personal sleeping devices (e.g. personal beds or bed sheets) were purchased solely for the consumption of household heads. We also fail to find direct evidence for purchase of any sleeping aids: we do not find evidence that cardholder households report increased values in asset categories that include sleeping aids such as mosquito repellents, beds, bed sheets, or electrical appliances after the cash transfer disbursement (Table A10);[41] nor do we find evidence that cardholder households increased expenditure on electricity or fuel in the last month, which could have potentially powered sleeping aids like electric fans and air conditioners.[42] Such an explanation is also inconsistent with Bessone et al. (2021) who conducted a randomized controlled trial with poor adults in India and showed that sleeping devices (e.g., pillow, bed, blanket, ear plugs) increased time in bed but had no effect on sleep efficiency.

Nutrition. Our results are also unlikely to be driven by changes in food consumption amongst cardholder households unless, again, only the household head experienced these changes, which seems improbable. Nevertheless, we can test for changes in a number of both household and individual nutrition indicators. There is no evidence of an increase or decrease in the value of food consumed in the past week by cardholder households after the cash transfer disbursement (Table A12). We also fail to find any evidence of changes in the frequency of meals consumed in the past week by cardholder household heads after the cash transfer. Lastly, household heads were not more or less likely to report having 'adequate food consumption' after the cash transfer disbursement.

Time use. We also rule out changes in time use as an explanation for our results (Table A13). We fail to find evidence for changes in bedtimes or wake-up times for cardholder household heads which suggests that improvement in sleep quality is not due to (i) increase or decrease in time in bed

[41]The fact that the improvement in sleep quality for cardholder household heads was short-lived, as discussed earlier, also indicates that purchase of sleeping aids is unlikely to explain our results.

[42]We also fail to find evidence for an increase in other monthly non-food expenditures, other annual expenditures, or other household assets amongst cardholder households after the cash transfer. (Table A11).

or (ii) changes in sleeping schedule. In fact, because cardholder household heads were less likely to report 'difficulty falling asleep' or 'trouble sleeping' after the cash transfer disbursement, the null effects for time in bed suggests that time asleep and sleep efficiency improved as well. This result also suggests that there were no dramatic shifts in work schedule for cardholder household heads (e.g., working nights). We also fail to find evidence for changes in total work hours for cardholder households heads in the past week which suggests longer or shorter work hours are not responsible for our results.

Halo or demand effects. It is extremely unlikely that our results are driven by demand characteristics or hawthorne effects, or reflect halo reporting effects of cash transfer receipt. First, the IFLS is a longitudinal survey conducted since 1993 by the RAND Corporation, a US-based non-profit, and not the Indonesian government. Second, there was no mention of BLSM transfers before the survey was administered. Third, we find no effects on affect that would likely be impacted by halo or demand effects (e.g., happiness or enthusiasm). Fourth, we detect improvement for objective as well as surveyor-measured cognitive indicators that are sensitive to sleep deprivation, but not for cognitive measures that are relatively unaffected by sleep deprivation. Finally, we find no effects on sleep quality for other members of cardholder households; it is unlikely that any halo reporting effects of cash transfer receipt would be concentrated amongst household heads.

5 Conclusion

Why don't the poor invest more in potentially high-return sleep? Our results suggest that the poor are unable to invest more in sleep due to, at least partially, the psychological impacts of financial concerns on sleep quality.

Using a regression discontinuity research design, we find eligible household heads surveyed just after the disbursement of an unconditional cash transfer in Indonesia – roughly 25 percent of monthly expenditures for the median recipient household – report better sleep quality (0.4 sd) compared to eligible household heads surveyed just before the cash transfer disbursement. Indeed, household heads were less likely to report that they had difficulty falling asleep or had

trouble sleeping. Eligible household heads also displayed improved performance on cognitive indicators sensitive to sleep deprivation (memory and attention) but not on cognitive measures relatively unaffected by sleep deprivation (reasoning or problem-solving). It is likely that the cash transfer relieved financial concerns among household heads, who are responsible for satisfying daily necessities of the household, improving their sleep quality. Immediately after disbursement, eligible households report an increase in savings and a decrease in outstanding loans. Eligible household heads also report feeling less worried, frustrated, and tired. These patterns of results are not observed for household heads ineligible for the cash transfer program which suggests that our results are not driven by seasonal confounders or aggregate shocks. These results are also not observed for other members of cardholder households, who unlike household heads, are not designated as the individual responsible for satisfying household necessities. We also show that changes in nutrition, time in bed, or labor supply, or the purchase of sleep aids are unlikely to explain our results.

Our results open up multiple new directions for future research. First, future studies might design field experiments that examine the importance of sleep quality as a mechanism for the psychological impacts of financial conditions on real world economic outcomes. Second, the longer-run psychological impacts of economic conditions on various dimensions of sleep deserve further investigation.

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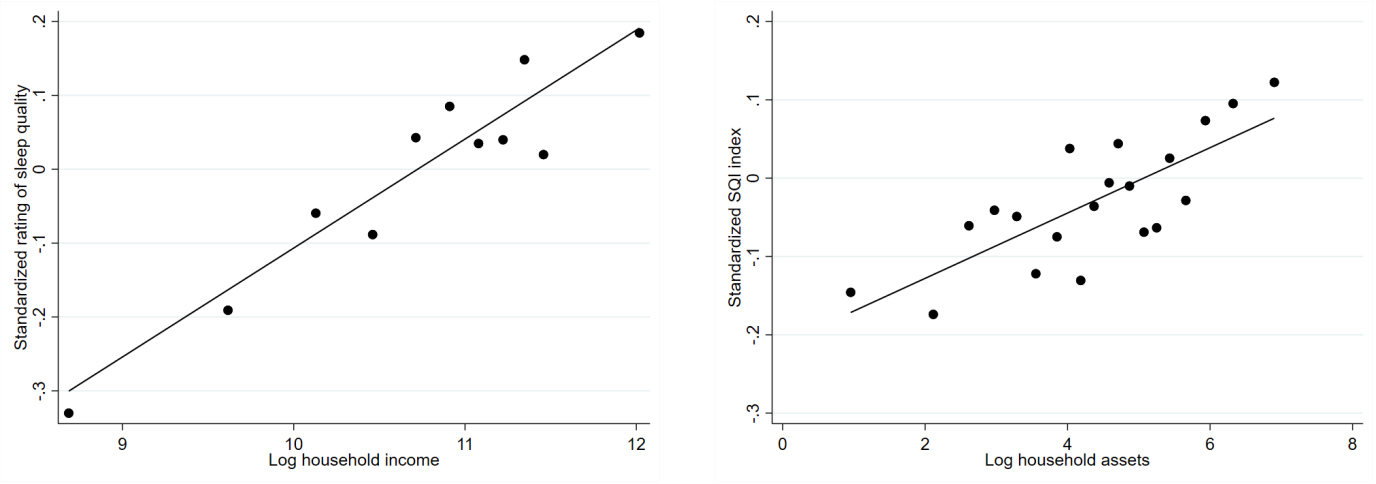
Tables and Figures



(a) Sleep quality (US)

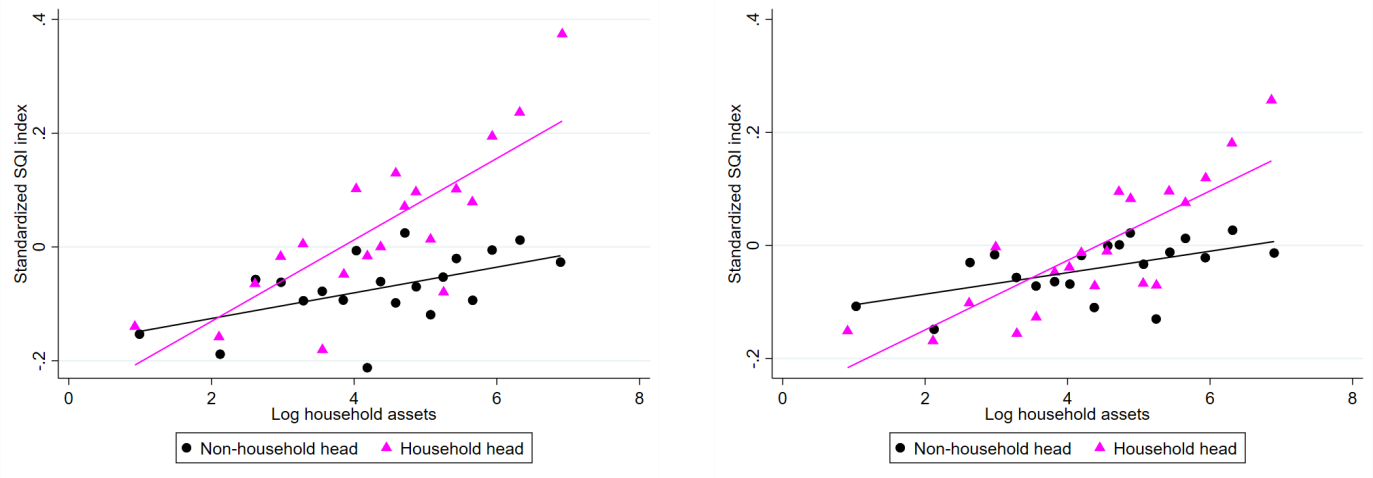
(Standardized Likert scale)

(b) Sleep quality (Indonesia)

(Standardized SQI index)

Figure 1. Standardized measures of sleep quality by socioeconomic indicators in the US and in Indonesia

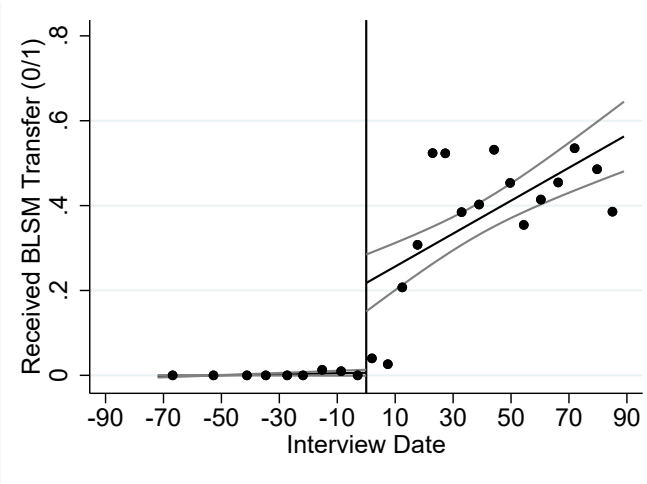
Notes: Panel (a) uses survey data from 909 employed women in the US from Kahneman et al. (2004). A standardized measure of sleep quality in the past month, which was recorded in the survey as a response to a four point Likert scale from very good to very bad is plotted against log household income (calculated as $log(X + 1)$ where X is household income in USD). Panel (b) uses data from individuals in our analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement. The standardized aggregate sleep quality (SQI) index is plotted against log household assets, calculated as $log(Y + 1)$ where Y is the sum of all assets reported in the household asset questionnaire (IDR 1 million) winsorized at 1 percent. Details on both the analysis sample and the SQI index are available in Section 2.2.



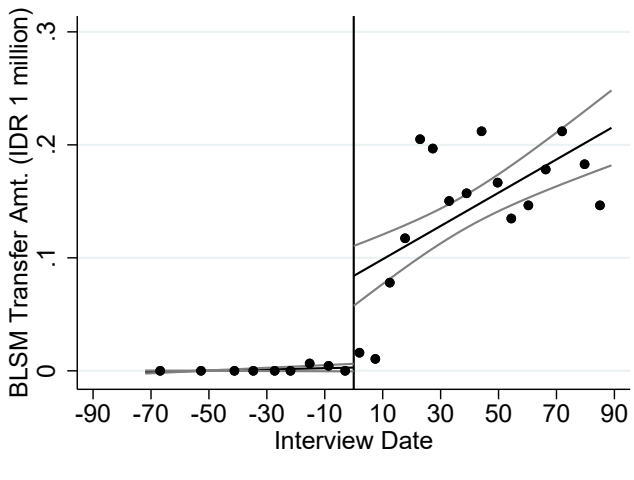
(a) No controls **(b) Controls for age and gender**

Figure 2. Standardized SQI index by socioeconomic status – as measured by log total household assets before the cash transfer disbursement – for household heads and other members of households

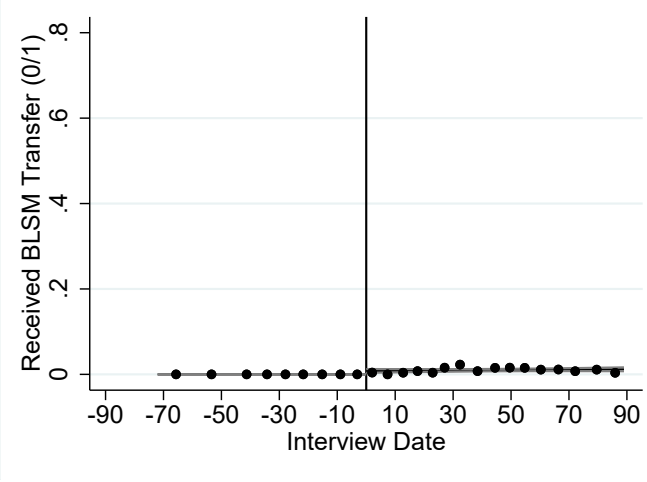
Notes: Data is for individuals in our main analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement. The standardized aggregate sleep quality (SQI) index is plotted against log household assets, calculated as $log(Y + 1)$ with Y as the sum of all assets reported in the household asset questionnaire (IDR 1 million) winsorized at 1 percent. Panel (a) includes no controls, while Panel (b) includes controls for age and gender. Details on both the analysis sample and the SQI index are available in Section 2.2.



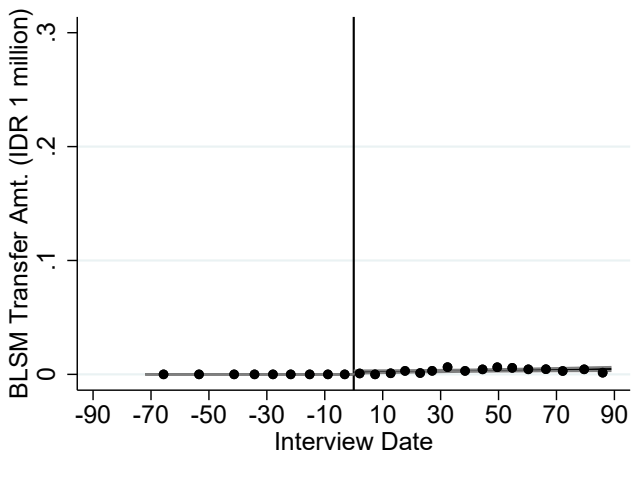
(a) Likelihood cardholders report BLSM transfer receipt (0/1)



(b) Cardholder reported BLSM transfer amounts (IDR 1 million)



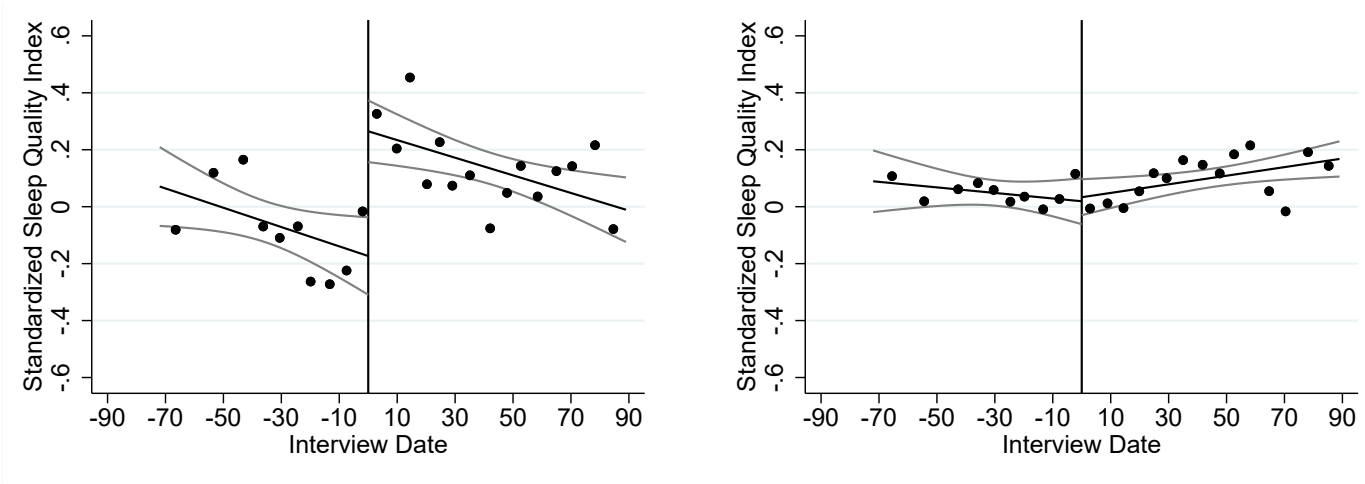
(c) Likelihood non-cardholders report BLSM transfer receipt (0/1)



(d) Non-cardholder reported BLSM transfer amounts (IDR 1 million)

Figure 3. Sharp increase in likelihood and amount of BLSM transfers for cardholder households, but not for non-cardholder households, at the treatment threshold, November 17 2014, the start of BLSM cash transfer disbursement

Notes: Panel (a) plots the probability a cardholder household reports receipt of a BLSM transfer before and after the treatment threshold, November 17 2014, the start of the BLSM cash transfer disbursement. Panel (b) plots the mean amount cardholder households report receiving in BLSM transfers before and after the treatment threshold. These same figures are plotted for non-cardholder households in Panels (c) and (d). 95% confidence intervals are plotted with standard errors are clustered at the enumeration area level.



(a) Cardholder household heads **(b) Non-cardholder household heads**

Figure 4. Sharp improvement in sleep quality – as measured by the SQI index – for cardholder household heads, but not for non-cardholder household heads, at the treatment threshold, November 17 2014, the start of BLSM cash transfer disbursement

Notes: The figure plots the standardized SQI index before and after the treatment threshold, November 17 2014, the start of the BLSM cash transfer disbursement. Cardholder household heads are plotted in Panel (a) and non-cardholder household heads are plotted in Panel (b). 95% confidence intervals are plotted with standard errors are clustered at the enumeration area level.

Table 1: Increase in BLSM cash transfer receipt for cardholder households, but not for non-cardholder households, just after the start of the BLSM cash transfer disbursement, November 17 2014

	(1)	(2)	(3)
	$\hat{\beta}_1$		
	SP cardholders	Non-cardholders	p-value of difference
Received BLSM cash transfer	0.17***	0.01	⟨0.00⟩***
	(0.04)	(0.00)	
BLSM transfer amount (IDR 1 million)	0.07***	0.00	⟨0.00⟩***
	(0.02)	(0.00)	
FE: Kabupaten	Yes	Yes	
N	1787	5951	

Notes: Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. All reported $\hat{\beta}_1$ coefficients are for a linear regression discontinuity specification that includes kabupaten fixed effects. 1 singleton observation was dropped in Column 1.

Table 2: Improvement in sleep quality – as measured by the standardized SQI index – for cardholder household heads, but not for non-cardholder household heads, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)
	$\hat{\beta}_1$			$\hat{\beta}_1$		
	SP card	No card	p-value of difference	SP card	No card	p-value of difference
Standardized SQI index	0.40***	-0.03	⟨0.00⟩***	0.41***	-0.03	⟨0.00⟩***
	(0.10)	(0.06)		(0.10)	(0.06)	
FE: Kabupaten	Yes	Yes		Yes	Yes	
FE: Gender	No	No		Yes	Yes	
FE: Age (decade)	No	No		Yes	Yes	
N	1787	5951		1786	5951	

Notes: Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. All reported $\hat{\beta}_1$ coefficients are for a linear regression discontinuity specifications that includes the listed fixed effects. Columns 3 and 6 report the p-value on the F-test for equality of coefficients between the preceeding two columns. 1 singleton observation was dropped in Column 1, and 2 singleton observations were dropped in Column 4.

Table 3: Improvement in all component parts of the SQI index for cardholder household heads, but not for non-cardholder household heads, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)
	$\hat{\beta}_1$		
Panel a: Standardized aggregated indices	SP cardholders	Non-cardholders	p-value of difference
Full sleep quality (SQI) index	0.41***	-0.03	⟨0.00⟩***
	(0.10)	(0.06)	
... Sleep disturbance index (reversed)	0.34***	-0.06	⟨0.00⟩***
	(0.10)	(0.05)	
... Sleep-related impairment index (reversed)	0.37***	-0.01	⟨0.00⟩***
	(0.10)	(0.06)	
Panel b: Standardized responses to the specific question: In the past 7 days ...			
... I had trouble sleeping (reversed)[1]	0.33***	-0.04	⟨0.00⟩***
	(0.10)	(0.06)	
... My quality of sleep was[2]	0.18*	0.02	⟨0.16⟩
	(0.10)	(0.06)	
... My quality of sleep was refreshing	0.10	-0.04	⟨0.21⟩
	(0.10)	(0.05)	
... I was satisfied with my sleep	0.17*	-0.02	⟨0.05⟩*
	(0.09)	(0.05)	
... I had difficulty falling asleep (reversed)	0.30***	-0.09*	⟨0.00⟩***
	(0.10)	(0.05)	
... I had a hard time concentrating because of poor sleep (reversed)	0.38***	-0.01	⟨0.00⟩***
	(0.10)	(0.06)	
... I had problems during the day because of poor sleep (reversed)	0.32***	-0.02	⟨0.00⟩***
	(0.10)	(0.06)	
... I had a hard time getting things done because I was sleepy (reversed)	0.16	0.03	⟨0.18⟩
	(0.10)	(0.06)	
... I felt tired (reversed)	0.23**	-0.01	⟨0.01⟩**
	(0.10)	(0.06)	
... I felt irritable because of poor sleep (reversed)	0.31***	-0.01	⟨0.00⟩***
	(0.10)	(0.06)	
FE: Kabupaten	Yes	Yes	
FE: Gender	Yes	Yes	
FE: Age (decade)	Yes	Yes	
Observations	1786	5951	

Notes: Question response options are 1: Not at all; 2: A little bit; 3: Somewhat; 4: Quite a bit; 5: Very much; except for question 1 (1: Never; 2: Rarely; 3: Sometimes; 4: Often; 5: Always) and question 2 (1: Very poor; 2: Poor; 3: Fair; 4: Good; 5:Very good). All reported $\hat{\beta}_1$ coefficients are for a linear regression discontinuity specification that includes kabupaten, age decade and gender fixed effects. Estimates in column 1 are for cardholder household heads and in column 2 are for non-cardholder household heads. Column 3 reports the p-value on the F-test for equality of coefficients between columns 1 and 2. Panel (a) presents impacts on the standardized aggregate score on all questions (our main outcome variable); on the italicized sleep disturbance questions; and on the sleep-related impairment questions. In Panel (b) the dependent variable is the standardized response to the specific question. 2 singleton observations were dropped in Column 1. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01.

Table 4: Improvement in cognitive performance sensitive to sleep deprivation for cardholder household heads, but not for non-cardholder household heads, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)
	SP cardholders			Non-cardholders		
	$\hat{\beta}_1$	$\hat{\beta}_1$	Obs.	$\hat{\beta}_1$	Obs.	p-value of difference
Panel a: Standardized performance on memory tests						
Rapid word recall	0.18*	0.17*	1772	0.03	5888	⟨0.16⟩
	(0.10)	(0.09)		(0.06)		
Delayed word recall	0.19**	0.19**	1772	0.02	5888	⟨0.04⟩**
	(0.08)	(0.07)		(0.06)		
Panel b: Interviewer's assessment of respondent's attention is excellent						
Attention on first questionnaire	0.02	0.02	1781	0.01	5921	⟨0.59⟩
	(0.03)	(0.03)		(0.01)		
Attention on second questionnaire	0.05**	0.05*	1781	-0.01	5921	⟨0.04⟩**
	(0.03)	(0.03)		(0.02)		
Panel c: Standardized performance on problem solving tests						
Math questions	-0.02	0.03	1399	0.09	4794	⟨0.57⟩
	(0.10)	(0.09)		(0.07)		
Panel d: Standardized performance on reasoning tests						
Ravens matrices	-0.00	0.00	1740	0.03	5843	⟨0.78⟩
	(0.10)	(0.09)		(0.05)		
Number series	-0.08	-0.10	1780	-0.02	5914	⟨0.37⟩
	(0.11)	(0.09)		(0.05)		
FE: Kabupaten	Yes	Yes		Yes		
FE: Gender	No	Yes		Yes		
FE: Age (decade)	No	Yes		Yes		
FE: Years of school	No	Yes		Yes		

Notes: Dependent variables in Panel (b) are indicators set to 1 if the interviewer considers the respondent's attention during the survey to be excellent, with interviewer fixed effects residualized out. All other dependent variables are standardized. Reported $\hat{\beta}_1$ coefficients are for a specification that includes the indicated fixed effects as well as a fixed effect for the assigned word list for rapid and delayed word recall. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. Column 6 reports the p-value on the F-test for equality of coefficients between columns 2 and 5. The analysis sample includes 1788 cardholder household heads and 5951 non-cardholder household heads. Missing data and dropped singletons account for small deviations in these values.

Table 5: Improvement in sleep quality – as measure by the SQI index – for cardholder household heads, but not for other members of cardholder households, irrespective of gender and age, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)
	SQI index (Std.) $\hat{\beta}_1$	Obs.	Household head share	Female share	
Panel a: All individuals					
All	0.12*	4528	0.40	0.52	
	(0.07)				
Male	0.29***	2189	0.66	0.00	
	(0.10)				
Female	-0.03	2337	0.15	1.00	
	(0.09)				
Ages 40 and under	0.01	2523	0.22	0.53	
	(0.09)				
Ages 41-64	0.30**	1672	0.59	0.50	
	(0.12)				
Ages 65 and over	0.07	328	0.70	0.50	
	(0.23)				
Panel b: Household heads					
All	0.41***	1786	1.00	0.19	
	(0.10)				
Male	0.42***	1442	1.00	0.00	
	(0.12)				
Female	0.39	342	1.00	1.00	
	(0.27)				
Ages 40 and under	0.45**	558	1.00	0.13	
	(0.19)				
Ages 41-64	0.49***	993	1.00	0.19	
	(0.14)				
Ages 65 and over	0.24	228	1.00	0.34	
	(0.28)				
Males ages 41-64	0.46***	802	1.00	0.00	
	(0.17)				
Feales ages 41-64	0.74**	188	1.00	1.00	
	(0.32)				
Panel c: Non-household heads					p-value of diff. w/ heads
All	-0.07	2739	0.00	0.73	$\langle 0.00 \rangle$***
	(0.08)				
Male	0.04	745	0.00	0.00	$\langle 0.03 \rangle$**
	(0.15)				
Female	-0.10	1993	0.00	1.00	$\langle 0.07 \rangle$*
	(0.09)				
Ages 40 and under	-0.11	1963	0.00	0.64	$\langle 0.01 \rangle$***
	(0.09)				
Ages 41-64	0.04	675	0.00	0.96	$\langle 0.02 \rangle$**
	(0.16)				
Ages 65 and over	-0.17	92	0.00	0.87	$\langle 0.30 \rangle$
	(0.38)				

Notes: Column 1 reports the estimated impact on the standardized SQI index, $\hat{\beta}_1$, from a linear specification that includes kabupaten, age decade, and gender fixed effects on the specified sub-group of individuals. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The share of the sub-group that identifies as the household head is reported in column 3 and the share of females in column 4. Panel (a) reports estimates pooling all individuals in cardholder households. Panel (b) restricts the sample to cardholder household heads, and Panel (c) to other members of cardholder households. Column 5 reports the p-value on the F-test for equality of coefficients between the same demographic subgroups in Panels (b) and (c). 1 singleton observation was dropped in Panel (a); 2 singleton observations were dropped in Panel (b) and Panel (c).

Table 6: Increase in savings and arisan contributions, and decrease in outstanding loans, for cardholder households, but not for non-cardholder households, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	SP cardholder households				Non-cardholder households			
	$\hat{\beta}_1$	$\hat{\beta}_1$	Pre-transfer raw mean [sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer raw mean [sd.]	Obs.	p-value of difference
Panel a: Log household expenditures last month (IDR 1 million)								
Arisan (ROSCA) contributions	0.03**	0.03**	0.06	1780	0.02	0.13	5933	⟨0.40⟩
	(0.01)	(0.01)	[0.15]		(0.01)	[0.27]		
Panel b: Log value of household's reported assets (IDR 1 million)								
Outstanding loans	-0.12	-0.14*	2.47	1759	-0.10	7.54	5893	⟨0.68⟩
	(0.08)	(0.08)	[12.38]		(0.08)	[27.18]		
Savings	0.11**	0.12**	0.39	1778	0.00	3.83	5923	⟨0.15⟩
	(0.05)	(0.05)	[2.00]		(0.07)	[13.71]		
FE: Kabupaten	Yes	Yes			Yes			
FE: Household characteristics	No	Yes			Yes			

Notes: Dependent variables are calculated as $Log(Y+1)$ where Y is the value measured in IDR 1 million and winsorized at the 1% level. The reported $\hat{\beta}_1$ coefficient in column1 only includes kabupaten fixed effects. Reported $\hat{\beta}_1$ coefficients in columns 2 and 5 are for a specification that includes fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the winsorized dependent variables, reported in columns 3 and 6, are calculated using the non-logged values for the subset of pre-transfer observations interviewed prior to November 17 2014. Column 8 reports the p-value on the F-test for equality of coefficients between columns 2 and 5. The analysis sample includes 1788 cardholder households and 5951 non-cardholder households. Missing data and dropped singletons account for small deviations in these values.

Table 7: Reduction in worries, frustration, and tiredness for cardholder household heads, but not for non-cardholder household heads or other members of cardholder households, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Heads SP cardholders			Heads non-cardholders			Non-head SP cardholders		
	$\hat{\beta}_1$	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	p-value of difference	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	p-value of difference
Frustrated	-0.06**	-0.06**	0.13	0.02	0.11	⟨0.02⟩**	0.02	0.11	⟨0.03⟩**
	(0.03)	(0.03)	[0.33]	(0.02)	[0.32]		(0.02)	[0.31]	
Worried	-0.07**	-0.06*	0.21	0.03	0.18	⟨0.02⟩**	0.01	0.21	⟨0.11⟩
	(0.03)	(0.03)	[0.41]	(0.03)	[0.38]		(0.03)	[0.41]	
Tired	-0.09**	-0.09**	0.46	0.00	0.45	⟨0.07⟩*	0.06	0.46	⟨0.01⟩***
	(0.04)	(0.04)	[0.50]	(0.03)	[0.50]		(0.04)	[0.50]	
Sad	-0.01	0.00	0.15	0.01	0.12	⟨0.83⟩	0.03	0.13	⟨0.40⟩
	(0.03)	(0.03)	[0.36]	(0.02)	[0.32]		(0.03)	[0.33]	
Lonely	0.03	0.03	0.17	0.04**	0.15	⟨0.67⟩	-0.03	0.17	⟨0.18⟩
	(0.03)	(0.03)	[0.37]	(0.02)	[0.35]		(0.03)	[0.37]	
Bored	-0.01	-0.01	0.11	-0.01	0.12	⟨0.90⟩	-0.00	0.17	⟨0.88⟩
	(0.03)	(0.03)	[0.31]	(0.02)	[0.33]		(0.03)	[0.38]	
Angry	-0.01	-0.01	0.08	-0.02	0.10	⟨0.64⟩	0.08***	0.15	⟨0.03⟩**
	(0.03)	(0.03)	[0.27]	(0.02)	[0.30]		(0.03)	[0.36]	
Stressed	-0.00	0.00	0.09	0.01	0.09	⟨0.91⟩	0.01	0.10	⟨0.93⟩
	(0.03)	(0.03)	[0.29]	(0.02)	[0.29]		(0.02)	[0.30]	
Pain	-0.06	-0.05	0.25	0.03	0.21	⟨0.05⟩*	-0.01	0.22	⟨0.35⟩
	(0.04)	(0.04)	[0.43]	(0.02)	[0.41]		(0.03)	[0.42]	
Content (reversed)	0.06	0.06	0.41	0.01	0.32	⟨0.30⟩	0.07	0.34	⟨0.88⟩
	(0.05)	(0.05)	[0.49]	(0.03)	[0.47]		(0.05)	[0.47]	
Enthusiastic (reversed)	0.01	0.01	0.43	0.02	0.38	⟨0.85⟩	-0.01	0.44	⟨0.74⟩
	(0.05)	(0.05)	[0.49]	(0.03)	[0.49]		(0.04)	[0.50]	
Happy (reversed)	-0.01	-0.01	0.35	-0.02	0.24	⟨0.76⟩	0.02	0.27	⟨0.62⟩
	(0.04)	(0.04)	[0.48]	(0.03)	[0.43]		(0.04)	[0.45]	
FE: Kabupaten	Yes	Yes		Yes			Yes		
FE: Gender	No	Yes		Yes			Yes		
FE: Age (decade)	No	Yes		Yes			Yes		
FE: Affect list ordering	Yes	Yes		Yes			Yes		
Observations	1787	1786		5951			2739		

Notes: Dependent variables are indicators set to 1 if the individual reports that yesterday they felt more than a little of the affect listed (response options were not at all, a little, somewhat, quite a bit and very), with the binary indicator reverse coded for positive affect. Reported $\hat{\beta}_1$ coefficients in columns 2, 4 and 7 are for a linear regression discontinuity specification that includes the indicated fixed effects. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 3, 5 and 8, are calculated using the subset of pre-transfer observations interviewed prior to November 17. Column 6 reports the p-value on the F-test for equality of coefficients between columns 2 and 4. Column 9 reports the p-value on the F-test for equality of coefficients between columns 2 and 7. 1 singleton observation was dropped in Column 1; 2 singleton observations were dropped in Column 2 and Column 7.

Online Appendix

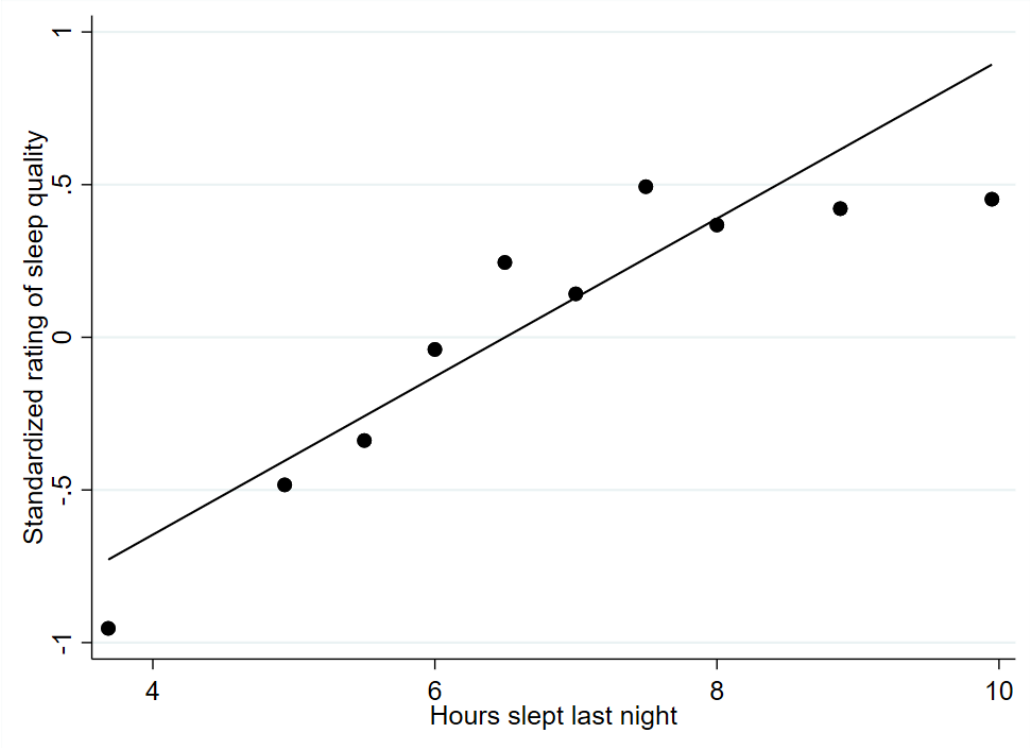


Figure A1. Individuals with better sleep quality get more sleep (US)

Notes: This figure uses survey data from 909 employed women in the US from Kahneman et al. (2004). Average hours of *actual* sleep per night over the past month is plotted against a standardized measure of sleep quality in the past month, which was recorded in the survey as a response to a four point Likert scale from very good to very bad.

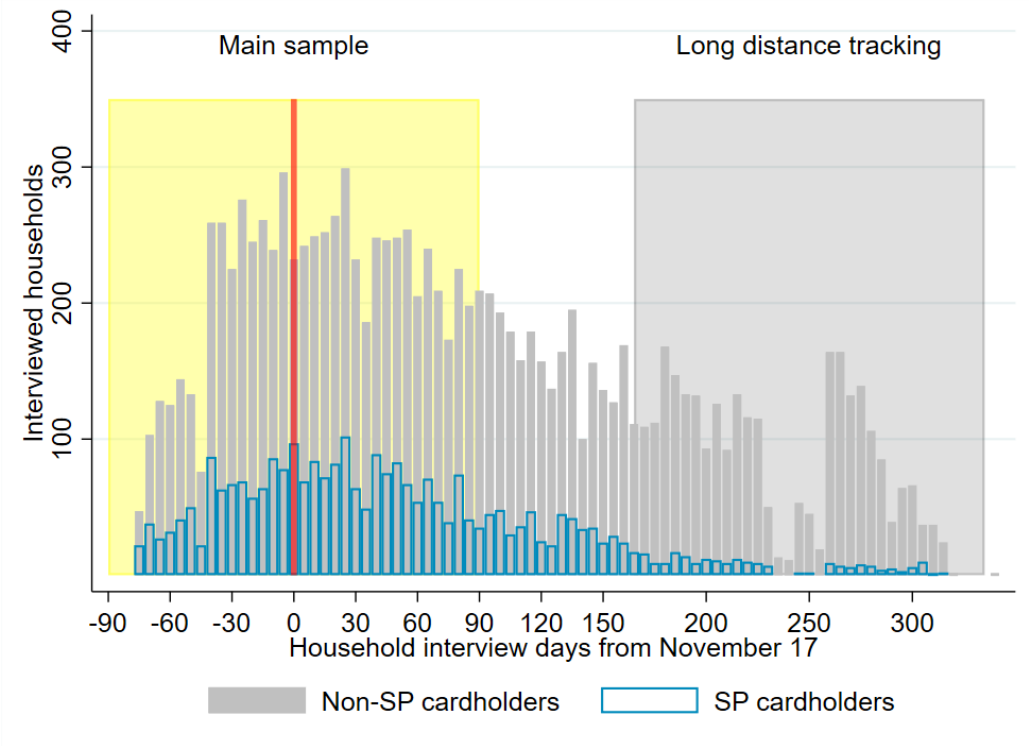
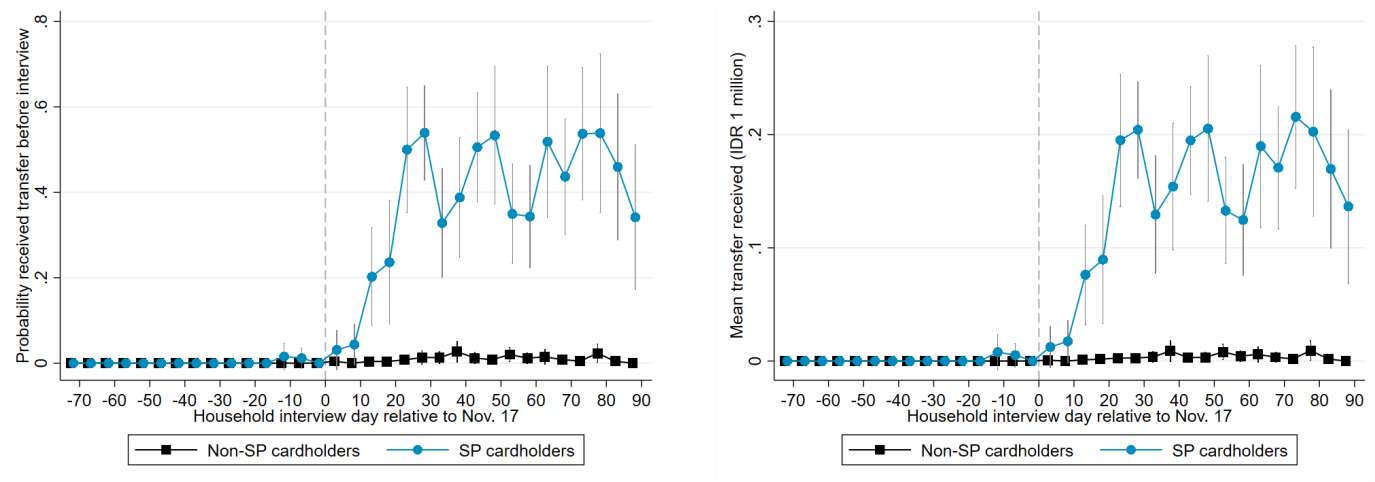


Figure A2. Temporal distribution of all the IFLS 5 household surveys

Notes: The histogram shows the number of social protection (SP) cardholder (in blue) and non-SP cardholder households (in grey) interviewed in 5 day bins during the survey period. The main survey was administered between August 2014 and April 2015, followed by long distance tracking of households that had moved more than a 45 minute trip from their original enumeration area. Days are numbered relative to November 17 2014. The red line marks November 17 2014, the beginning of BLSM cash transfer disbursement. Our analysis sample, highlighted in yellow, runs from 3 months (90 days) before to 90 days after November 17, 2014.



(a) Likelihood of BLSM transfer receipt (0/1) **(b) BLSM transfer amounts (IDR 1 million)**

Figure A3. Rapid increase in likelihood and amount of BLSM transfers for cardholder households, but not for non-cardholder households, from November 17 2014, the start of BLSM cash transfer disbursement

Notes: Panel (a) plots the probability a household reports receipt of a BLSM transfer in the 3 months before and after November 17 2014, the start of the transfer disbursement, in five day bins. Panel (b) plots the mean amount households report receiving in BLSM transfers. Cardholder households are plotted in blue and non-cardholder households are plotted in black. 95% confidence intervals are plotted with standard errors are clustered at the enumeration area level. The dashed line indicates the start of BLSM cash transfer disbursement (November 17 2014).

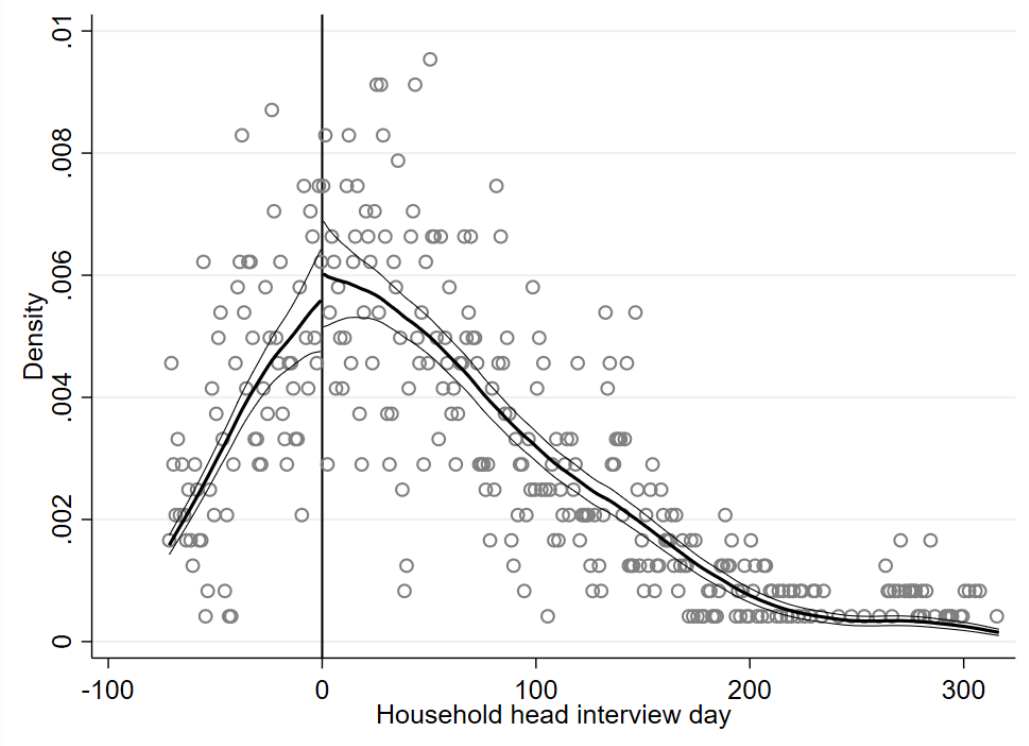
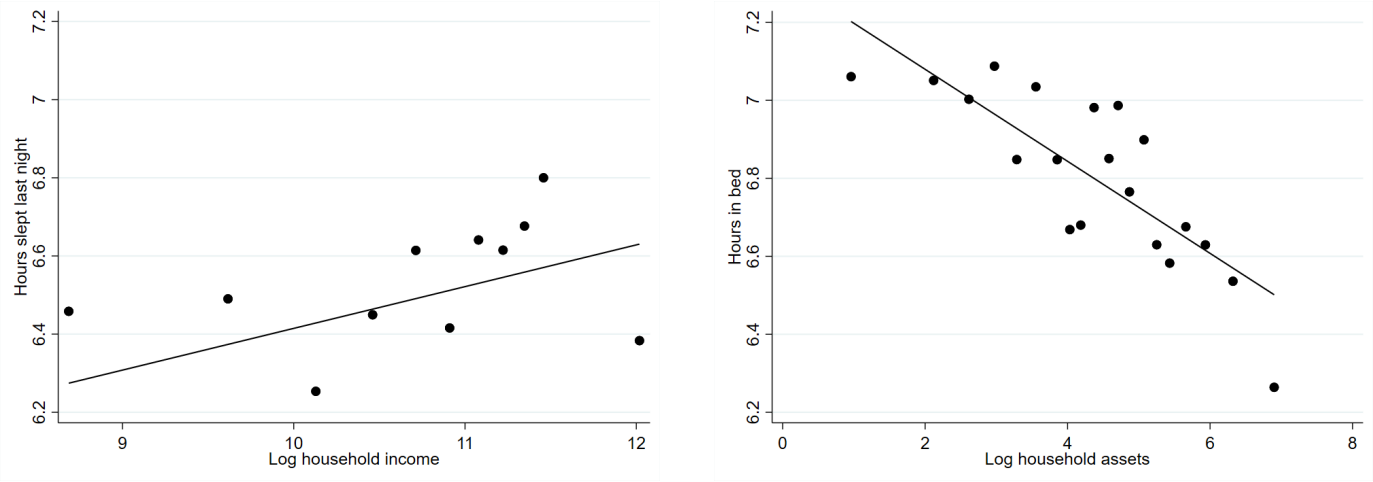


Figure A4. Density of the survey week distribution is continuous across the treatment threshold for cardholder household heads

Notes: The McCrary test statistic for cardholder household heads is 0.07 with a standard error of 0.11 .



(a) Time asleep (US) **(b) Time in bed (Indonesia)**

Figure A5. Sleep quantity in the US and time in bed in Indonesia by socioeconomic indicators

Notes: Panel (a) uses survey data from 909 employed women in the US from Kahneman et al. (2004). Average hours of *actual* sleep per night over the past month is plotted against log household income, calculated as $log(X + 1)$ where X is household income in USD. Panel (b) uses data from individuals in our analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement. Time in bed, which is calculated as the difference between wake-up time and bedtime yesterday is plotted against log household assets, calculated as $log(Y + 1)$ where Y is the sum of all assets reported in the household asset questionnaire (IDR 1 million), winsorized at 1 percent. Details on the analysis sample are available in Section 2.2.

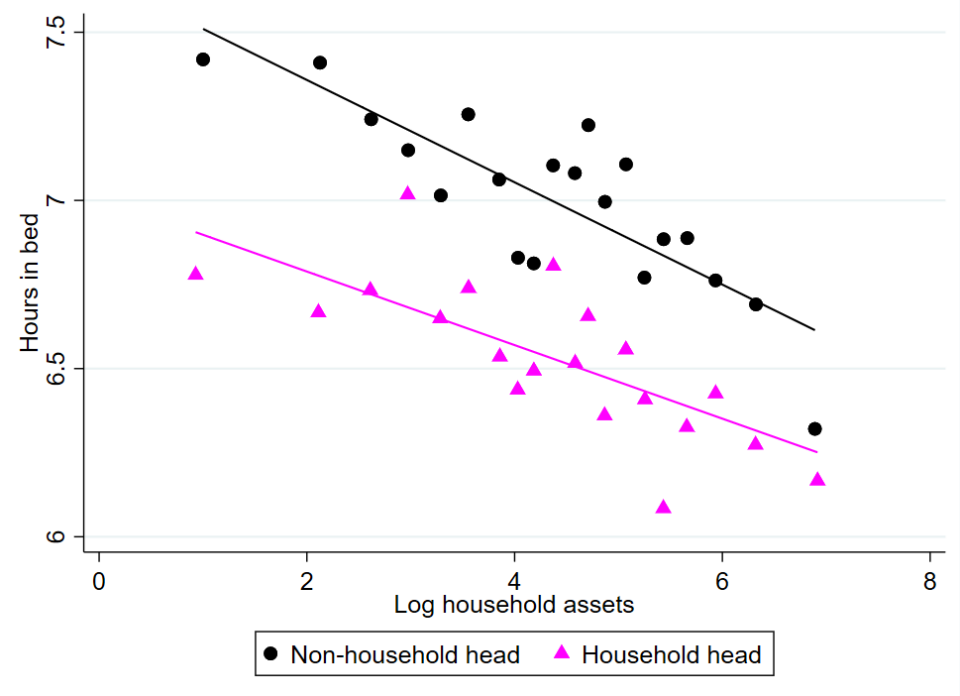


Figure A6. Time in bed (in hours) by socioeconomic status – as measured by log total household assets before the cash transfer disbursement – for household heads and other members of households

Notes: Data is for individuals in our analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement (baseline). Time in bed, which is calculated as the difference between wake-up time and bedtime yesterday is plotted against log household assets, calculated as $log(Y + 1)$ where Y is the sum of all assets reported in the household asset questionnaire (IDR 1 million), winsorized at 1 percent. Details on the analysis sample are available in Section 2.2.

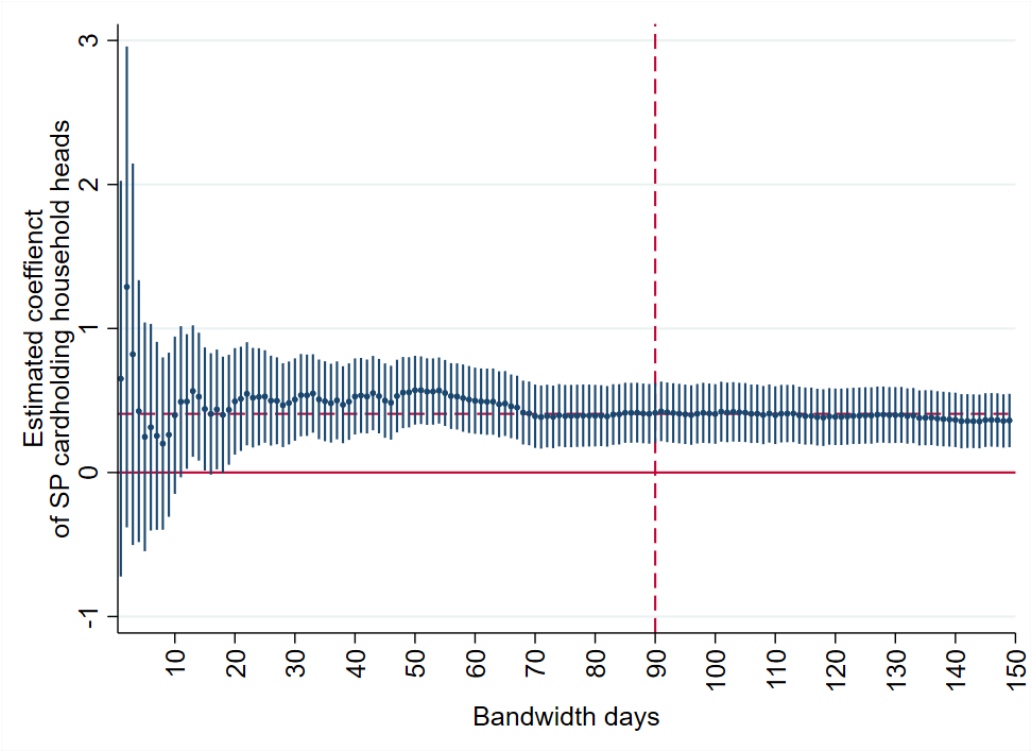


Figure A7. Improvement in sleep quality – as measured by the SQI index – for cardholder household heads is robust to bandwidth choice

Notes: Plotted estimates show the estimate of $\hat{\beta}_1$ with kabupaten, age decade, and gender fixed effects using different bandwidths around the transfer disbursement week. Note that the first interviews occurred 72 days prior to November 17 so widening the bandwidth beyond 72 days only extends the post period. The dashed lines highlight the bandwidth used throughout the paper. The figure display 95% confidence intervals with standard errors clustered at the enumeration area level.

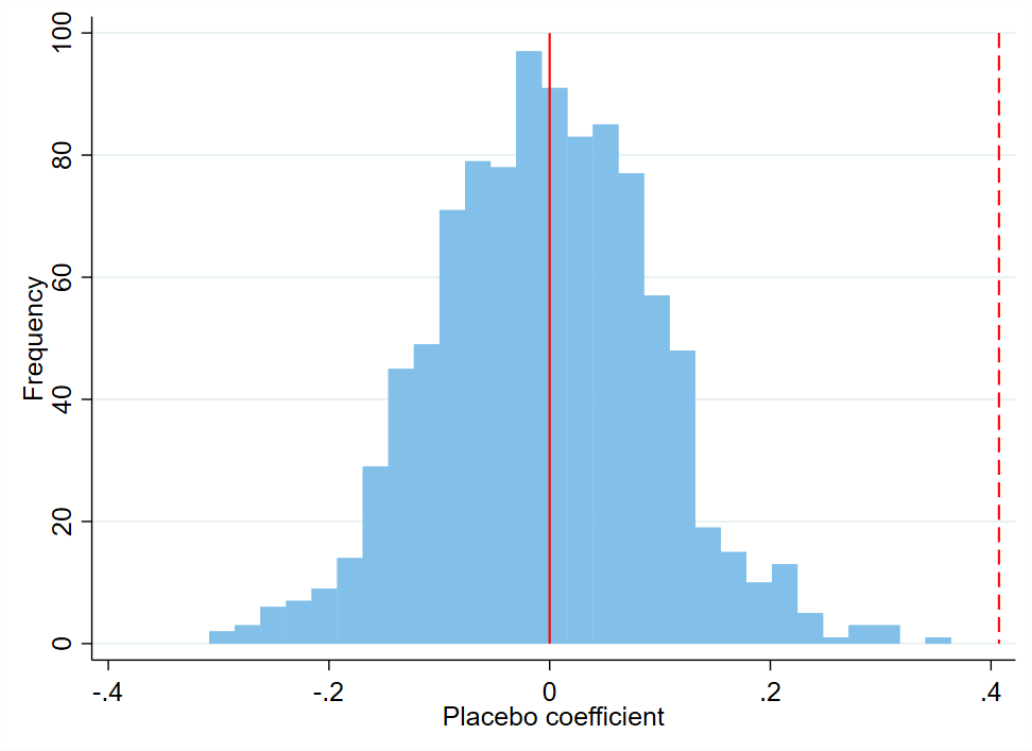
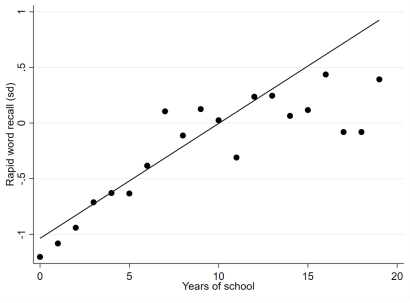
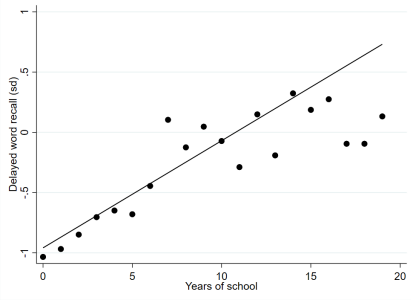


Figure A8. Placebo test: impact on sleep quality – as measured by the SQI index – for cardholder household heads

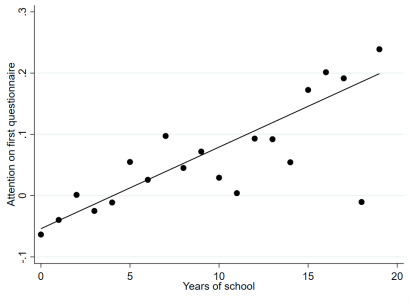
Notes: The figure presents the distribution of 1000 placebo estimates of $\hat{\beta}_1$ with kabupaten, age decade, and gender fixed effects, where the household heads' interview day is randomly assigned. The dashed line highlights the observed effect of 0.41 standard deviation corresponding to the true interview days.



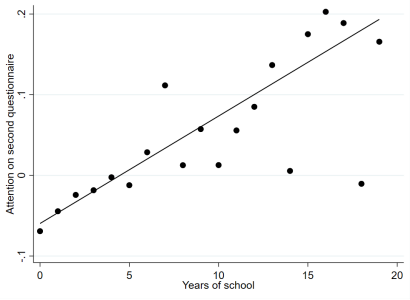
(a) Rapid word recall



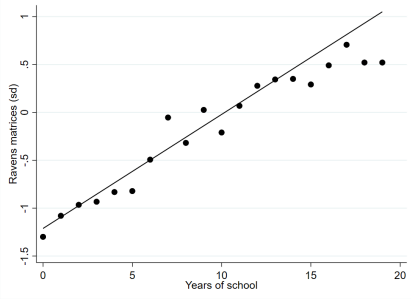
(b) Delayed word recall



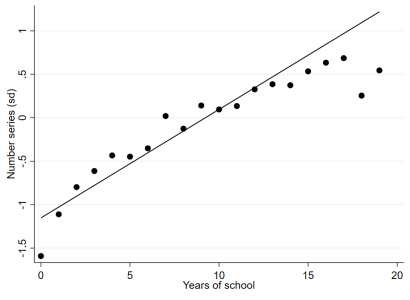
(c) Attention early



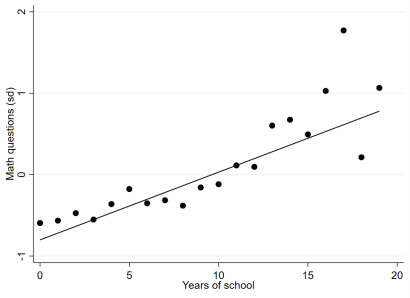
(d) Attention late



(e) Ravens matrices



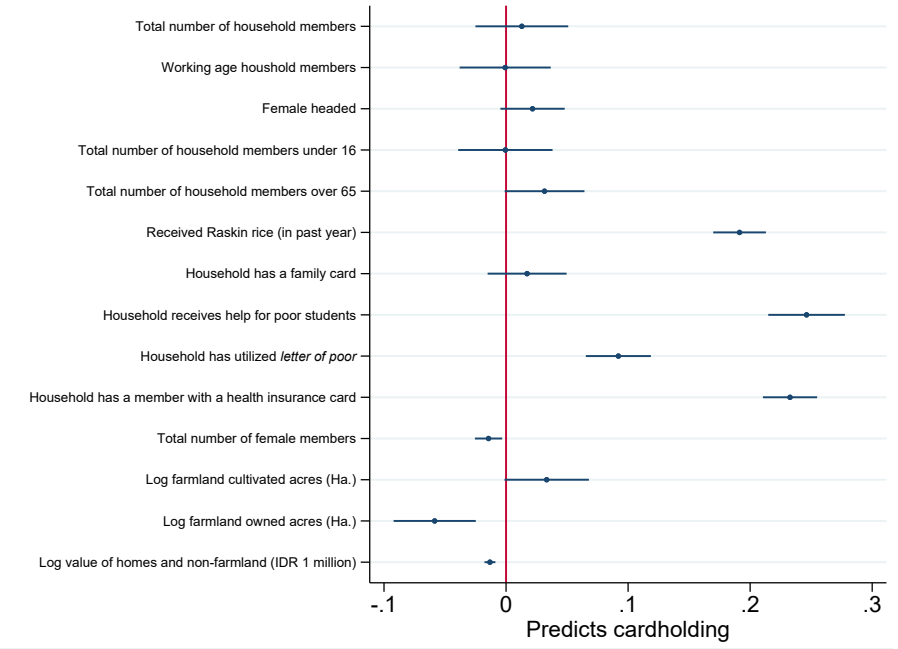
(f) Number series



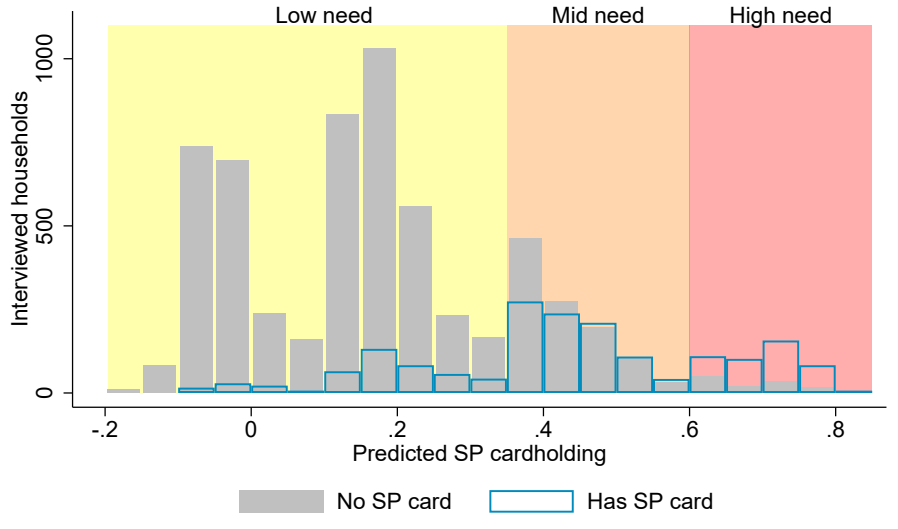
(g) Math questions

Figure A9. Cognitive measures are strongly correlated with years of schooling

Notes: Data is for household heads in our main analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement. Each cognitive measure is separately plotted against years of schooling amongst household heads.



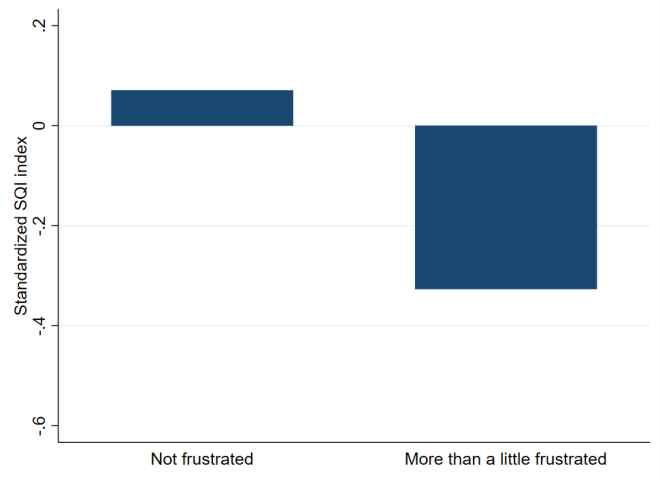
(a) Predictors for household having an SP card



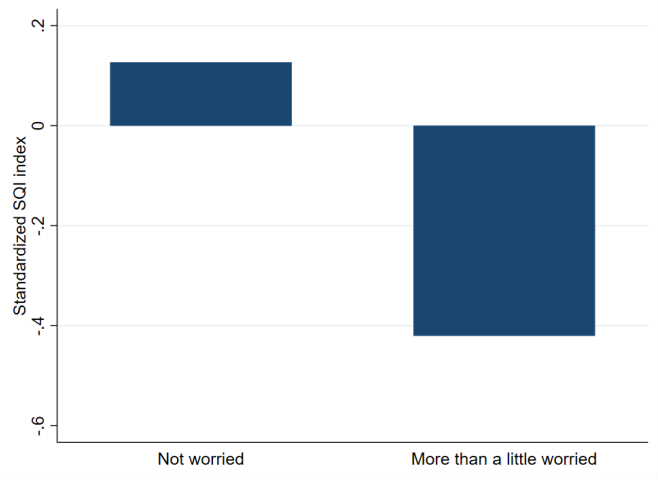
(b) Predicted SP cardholding by actual cardholding

Figure A10. Categorizing households by need based on predictors of SP cardholding

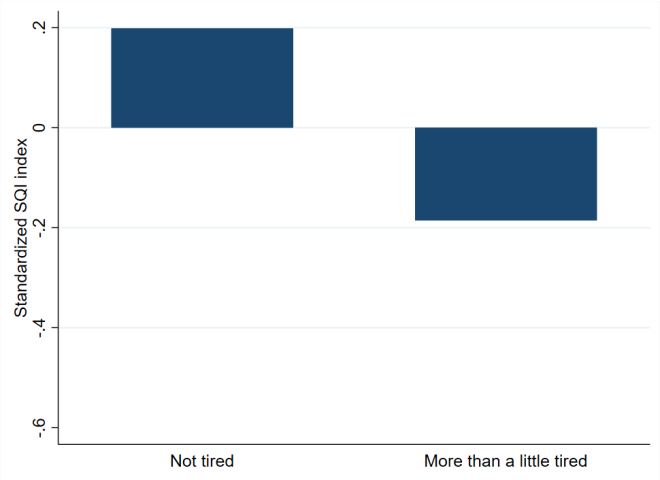
Notes: Predicted values of household cardholding are generated by regressing the indicator for having an SP card on the household characteristics included in Table A1, Panel (b). Estimates of these variables' predictive coefficients are presented in Panel (a). The generated predicted values for SP card ownership are plotted in Panel (b) for both SP cardholder households in blue and non-cardholder households in grey. Households are categorized into low-, mid- and high need households using the following thresholds: Low need if $E[\textit{has SP card}] < 0.35$; mid need if $0.35 \leq E[\textit{has SP card}] \leq 0.6$; and high need if $E[\textit{has SP card}] > 0.6$.



(a) Frustration



(b) Worry



(c) Tiredness

Figure A11. Standardized SQI index by frustration, worry, and tiredness amongst household heads

Notes: Data is for household heads in our main analysis sample in Indonesia who were interviewed prior to the cash transfer disbursement. The standardized aggregate sleep quality (SQI) index is plotted against frustration, worry, and tiredness amongst household heads. Details on both the analysis sample and the SQI index are available in Section 2.2.

Table A1: Households surveyed on or just before and just after November 17 are similar on observables

	(1) $\hat{\beta}_1$	(2) Pre-transfer Mean [Sd.]	(3) Obs.	(4) $\hat{\beta}_1$	(5) Pre-transfer Mean [Sd.]	(6) Obs.
Panel a: Across all households						
	All households					
Household survey participation	0.01	0.98	8568			
	(0.01)	[0.12]				
Household head has SQI measure	0.01	0.91	8479			
	(0.01)	[0.29]				
Reports having an SP card	0.04	0.22	7739			
	(0.03)	[0.41]				
Panel b: Households						
	SP cardholders			Non-cardholders		
Received Raskin rice (in past year)	0.04	0.82	1785	0.01	0.47	5937
	(0.04)	[0.38]		(0.06)	[0.50]	
Household has a member with a health insurance card	0.01	0.79	1787	-0.10***	0.38	5951
	(0.04)	[0.41]		(0.03)	[0.48]	
Household has a family card	-0.02	0.96	1787	-0.01	0.94	5951
	(0.02)	[0.21]		(0.02)	[0.25]	
Household receives help for poor students	-0.00	0.30	1787	0.01	0.07	5951
	(0.05)	[0.46]		(0.02)	[0.26]	
Household utilized *letter of poor*	-0.05	0.39	1787	-0.02	0.16	5951
	(0.05)	[0.49]		(0.03)	[0.37]	
Total number of household members	-0.12	4.13	1787	-0.15	3.73	5951
	(0.19)	[1.89]		(0.11)	[1.72]	
Working age household members	-0.06	2.57	1787	-0.06	2.41	5951
	(0.14)	[1.39]		(0.08)	[1.17]	
Total number of household members under 16	0.04	1.32	1787	-0.04	1.12	5951
	(0.12)	[1.09]		(0.07)	[1.02]	
Total number of household members over 65	-0.09	0.33	1787	-0.04	0.29	5951
	(0.07)	[0.60]		(0.03)	[0.58]	
Female headed	-0.02	0.19	1787	0.00	0.18	5951
	(0.04)	[0.40]		(0.03)	[0.38]	
Total number of female members	-0.06	2.08	1787	-0.13**	1.91	5951
	(0.12)	[1.13]		(0.06)	[1.10]	
Log value of homes and non-farmland (IDR 1 million)	-0.28	3.10	1787	0.01	3.68	5950
	(0.20)	[1.81]		(0.14)	[2.12]	
Log farmland owned (Ha.)	0.00	0.03	1787	-0.03	0.11	5951
	(0.03)	[0.15]		(0.05)	[0.35]	
Log farmland cultivated (Ha.)	-0.01	0.05	1787	-0.01	0.10	5951
	(0.02)	[0.20]		(0.04)	[0.32]	
... p-value on test of joint significance		⟨0.70⟩			⟨0.21⟩	
Panel c: Household heads						
	SP cardholders			Non-cardholders		
No SQI measure	-0.04	0.08	1941	-0.01	0.09	6537
	(0.03)	[0.27]		(0.02)	[0.29]	
Age	-0.52	49.26	1787	-0.25	47.04	5951
	(1.44)	[13.71]		(1.01)	[14.58]	
Female	-0.04	0.20	1787	0.00	0.18	5951
	(0.04)	[0.40]		(0.02)	[0.39]	
Over 65	-0.01	0.15	1787	-0.00	0.13	5951
	(0.04)	[0.36]		(0.02)	[0.34]	
Married and/or cohabitating	0.04	0.80	1787	-0.00	0.81	5951
	(0.04)	[0.40]		(0.03)	[0.39]	
Years of schooling	-0.10	5.57	1782	-0.45	8.27	5926
	(0.42)	[3.75]		(0.36)	[4.57]	
Individual survey start time	-0.09	15.82	1787	0.21	16.04	5951
	(0.35)	[3.76]		(0.20)	[3.85]	
... p-value on test of joint significance		⟨0.36⟩			⟨0.83⟩	
Panel d: Non-household heads						
	SP cardholders			Non-cardholders		
No SQI measure	-0.02	0.11	3048	-0.00	0.11	8782
	(0.03)	[0.31]		(0.02)	[0.32]	
Age	-1.88	34.47	2740	-0.06	34.95	7867
	(1.32)	[15.12]		(0.76)	[14.90]	
Female	-0.02	0.74	2740	-0.01	0.77	7867
	(0.03)	[0.44]		(0.02)	[0.42]	
Over 65	-0.02	0.04	2740	-0.01	0.04	7867
	(0.02)	[0.19]		(0.01)	[0.20]	
Married and/or cohabitating	0.01	0.61	2740	-0.01	0.68	7867
	(0.04)	[0.49]		(0.02)	[0.47]	
Years of schooling	-0.03	7.35	2729	-0.42	9.11	7840
	(0.39)	[3.76]		(0.36)	[4.17]	
Individual survey start time	0.09	15.55	2740	-0.21	15.75	7867
	(0.31)	[3.78]		(0.19)	[3.80]	
... p-value on test of joint significance		⟨0.73⟩			⟨0.69⟩	

Notes: Units of observation are households in panels (a) and (b) and individuals in panels (c) and (d). All reported $\hat{\beta}_1$ coefficients in columns 1 and 4 are for a linear regression discontinuity specification that includes kabupaten fixed effects. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2 and 5, are calculated using the subset of pre-transfer observations interviewed prior to November 17 2014. Columns 3 and 6 report the number of observations used in the estimation. The main analysis sample includes 1788 cardholder and 5951 non-cardholder households. The 1788 cardholder households include 1788 household heads and 2741 other members of households for whom sleep quality is observed. The 5951 non-cardholder households include 5951 household heads and 7868 other members of households.The value of homes and non-farmland is winsorized at 1 percent. Missing data and dropped singletons account for small deviations in these values. The last row of each panel reports the p-value of the χ^2 test for joint significance.

Table A2: All estimates presented in the paper are robust to relaxation of sample restrictions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Main sample					...dropping observed head SQI restriction					...dropping observed head SQI and strict window restrictions				
Panel a: First stage															
	Heads SP card	Heads no-card	p-value of diff.			Heads SP card	Heads no-card	p-value of diff.			Heads SP card	Heads no-card	p-value of diff.		
Received BLSM cash transfer	0.17***	0.01	⟨0.00⟩***			0.17***	0.01	⟨0.00⟩***			0.26***	0.01***	⟨0.00⟩***		
	(0.04)	(0.00)				(0.04)	(0.00)				(0.04)	(0.00)			
	[1787]	[5951]				[1787]	[5951]				[1804]	[6015]			
BLSM transfer amount (IDR 1 million)	0.07***	0.00	⟨0.00⟩***			0.07***	0.00	⟨0.00⟩***			0.10***	0.00**	⟨0.00⟩***		
	(0.02)	(0.00)				(0.02)	(0.00)				(0.01)	(0.00)			
	[1787]	[5951]				[1787]	[5951]				[1804]	[6015]			
Panel b: Individual outcome variables															
	Heads SP card	Heads no-card	p-value of diff. w/ SP heads	Non-head SP card	p-value of diff. w/ SP heads	Heads SP card	Heads no-card	p-value of diff. w/ SP heads	Non-heads SP card	p-value of diff. w/ SP heads	Heads SP card	Heads no-card	p-value of diff. w/ SP heads	Non-heads SP card	p-value of diff. w/ SP heads
SQI index (standardized)	0.41***	-0.03	⟨0.00⟩***	-0.07	⟨0.00⟩***	0.41***	-0.03	⟨0.00⟩***	-0.07	⟨0.00⟩***	0.41***	-0.02	⟨0.00⟩***	-0.07	⟨0.00⟩***
	(0.10)	(0.06)		(0.08)		(0.10)	(0.06)		(0.08)		(0.10)	(0.06)		(0.08)	
	[1786]	[5951]		[2739]		[1786]	[5951]		[2944]		[1788]	[5971]		[3108]	
Yesterday was more than a little worried	-0.06*	0.03	⟨0.02⟩**	0.01	⟨0.11⟩	-0.06*	0.03	⟨0.02⟩**	0.01	⟨0.11⟩	-0.06*	0.03	⟨0.03⟩**	-0.00	⟨0.17⟩
	(0.03)	(0.03)		(0.03)		(0.03)	(0.03)		(0.03)		(0.03)	(0.03)		(0.03)	
	[1786]	[5951]		[2739]		[1786]	[5951]		[2944]		[1788]	[5971]		[3108]	
Yesterday was more than a little frustrated	-0.06**	0.02	⟨0.02⟩**	0.02	⟨0.03⟩**	-0.06**	0.02	⟨0.02⟩**	0.02	⟨0.02⟩**	-0.06**	0.02	⟨0.02⟩**	0.03	⟨0.01⟩**
	(0.03)	(0.02)		(0.02)		(0.03)	(0.02)		(0.02)		(0.03)	(0.02)		(0.02)	
	[1786]	[5951]		[2739]		[1786]	[5951]		[2944]		[1788]	[5971]		[3108]	
Yesterday was more than a little tired	-0.09**	0.00	⟨0.07⟩*	0.06	⟨0.01⟩***	-0.09**	0.00	⟨0.07⟩*	0.05	⟨0.01⟩***	-0.09**	-0.00	⟨0.07⟩*	0.05	⟨0.00⟩***
	(0.04)	(0.03)		(0.04)		(0.04)	(0.03)		(0.04)		(0.04)	(0.03)		(0.04)	
	[1786]	[5951]		[2739]		[1786]	[5951]		[2944]		[1788]	[5971]		[3108]	
Rapid word recall	0.17*	0.03	⟨0.16⟩	0.09	⟨0.51⟩	0.17*	0.03	⟨0.16⟩	0.08	⟨0.43⟩	0.17*	0.04	⟨0.17⟩	0.05	⟨0.26⟩
	(0.09)	(0.06)		(0.08)		(0.09)	(0.06)		(0.08)		(0.09)	(0.06)		(0.08)	
	[1772]	[5888]		[2721]		[1772]	[5888]		[2925]		[1774]	[5909]		[3089]	
Delayed word recall	0.19**	0.02	⟨0.04⟩**	0.06	⟨0.27⟩	0.19**	0.02	⟨0.04⟩**	0.08	⟨0.35⟩	0.19**	0.02	⟨0.04⟩**	0.07	⟨0.26⟩
	(0.07)	(0.06)		(0.09)		(0.07)	(0.06)		(0.09)		(0.07)	(0.06)		(0.08)	
	[1772]	[5888]		[2721]		[1772]	[5888]		[2925]		[1774]	[5909]		[3089]	
Enumerator rated attention as excellent	0.05*	-0.01	⟨0.04⟩**	0.01	⟨0.34⟩	0.05*	-0.01	⟨0.04⟩**	0.02	⟨0.31⟩	0.05*	-0.01	⟨0.04⟩**	0.02	⟨0.25⟩
	(0.03)	(0.02)		(0.02)		(0.03)	(0.02)		(0.02)		(0.03)	(0.02)		(0.02)	
	[1781]	[5921]		[2737]		[1781]	[5922]		[2930]		[1783]	[5943]		[3094]	
Panel c: Household variables															
	SP card	No-card	p-value of diff.			SP card	No-card	p-value of diff.			SP card	No-card	p-value of diff.		
Log arisan contributions last month	0.03**	0.02	⟨0.40⟩			0.03**	0.02	⟨0.47⟩			0.03**	0.02	⟨0.44⟩		
	(0.01)	(0.01)				(0.01)	(0.01)				(0.01)	(0.01)			
	[1780]	[5933]				[1934]	[6497]				[2060]	[6975]			
Log household savings	0.12**	0.00	⟨0.15⟩			0.09*	0.01	⟨0.30⟩			0.10*	0.00	⟨0.22⟩		
	(0.05)	(0.07)				(0.05)	(0.07)				(0.05)	(0.06)			
	[1778]	[5923]				[1933]	[6498]				[2061]	[6972]			
Log outstanding loans	-0.14*	-0.10	⟨0.68⟩			-0.14*	-0.09	⟨0.64⟩			-0.13*	-0.10	⟨0.75⟩		
	(0.08)	(0.08)				(0.07)	(0.08)				(0.07)	(0.07)			
	[1759]	[5893]				[1912]	[6453]				[2036]	[6923]			

Notes: Columns 1-5 present the main estimates using the sample used throughout the paper. Columns 6-10 relax the restrictions that limited the sample to include households where the household head answered the 10-item questionnaire on sleep quality. Columns 11-15 further relax restrictions that limited the the sample to include (i) only households where both the household survey and household head interviews were conducted within 90 days before or after November 17, 2014. Reported $\hat{\beta}_1$ coefficients are for a linear specification that includes the same set of fixed effects used for that dependent variable in the main paper: for individual specifications these include age decade, gender, and kabupaten fixed effect with the addition years of education for cognitive outcomes, affect list for affect outcomes and the word list assigned for the word recall outcomes. For household variables fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten are included. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. Columns 3, 8 and 13 report the p-value on the F-test for equality of coefficients between cardholder and non-cardholder household heads in the sample. Columns 5, 10, and 15 report the p-value on the F-test for equality between cardholder household heads and other members of cardholder households.

Table A3: No statistically significant change in the SQI resulting from the fuel subsidy cut for non-cardholder household heads with above or below median fuel consumption levels as measured at baseline (IFLS 4)

	(1)	(2)	(3)	(4)	(5)
	Below Median		Above median		
	$\hat{\beta}_1$	Obs.	$\hat{\beta}_1$	Obs.	p-value of difference
Standardized SQI index	-0.07	2676	0.02	3275	$\langle 0.96 \rangle$
	(0.09)		(0.07)		

Notes: Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. All reported $\hat{\beta}_1$ coefficients use a linear regression discontinuity specification that includes kabupaten, age decade, and gender fixed effects. Fuel consumption is measured as the sum of household expenditures on fuel and transportation reported in the previous IFLS survey, conducted in 2007. Column 5 reports the p-value on the F-test for equality of coefficients between columns 2 and 3. Observations are limited to households also observed in the IFLS4 survey.

Table A4: No improvement in sleep quality – as measured by the standardized SQI index – for non-cardholder household heads similar to cardholder household heads, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)
	Non-cardholders All	Non-cardholders Receiving other aid	Non-cardholders Mid and high need
Standardized SQI index	-0.03	-0.09	-0.04
	(0.06)	(0.08)	(0.10)
N	5951	3250	1102

Notes: Estimates are presented for household heads in all non-cardholder households in column 1. In column 2 the sample is restricted to household heads in non-cardholder households that report receiving other forms of government aid. In column 3 the sample is restricted to household heads in non-cardholder households that are categorized as mid or high need ($E[\textit{has SP card}] > 0.35$) as illustrated in Figure A10. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. All reported $\hat{\beta}_1$ coefficients are for a linear specification that includes kabupaten, age decade, and gender fixed effects.

Table A5: Improvement in cognitive performance sensitive to sleep deprivation for cardholder household heads, but not for non-cardholder household heads or other members of cardholder households, just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Heads SP cardholders			Heads non-cardholders			Non-head SP cardholders		
	$\hat{\beta}_1$	$\hat{\beta}_1$	Obs.	$\hat{\beta}_1$	Obs.	p-value of difference	$\hat{\beta}_1$	Obs.	p-value of difference
Panel a: Standardized performance on memory tests									
Rapid word recall	0.18*	0.17*	1772	0.03	5888	⟨0.16⟩	0.09	2721	⟨0.51⟩
	(0.10)	(0.09)		(0.06)			(0.08)		
Delayed word recall	0.19**	0.19**	1772	0.02	5888	⟨0.04⟩**	0.06	2721	⟨0.27⟩
	(0.08)	(0.07)		(0.06)			(0.09)		
Panel b: Interviewer's assessment of respondent's attention is excellent									
Attention on first questionnaire	0.02	0.02	1781	0.01	5921	⟨0.59⟩	0.00	2726	⟨0.58⟩
	(0.03)	(0.03)		(0.01)			(0.02)		
Attention on second questionnaire	0.05**	0.05*	1781	-0.01	5921	⟨0.04⟩**	0.02	2726	⟨0.34⟩
	(0.03)	(0.03)		(0.02)			(0.02)		
Panel c: Standardized performance on problem solving tests									
Math questions	-0.02	0.03	1399	0.09	4794	⟨0.57⟩	0.02	2534	⟨1.00⟩
	(0.10)	(0.09)		(0.07)			(0.07)		
Panel d: Standardized performance on reasoning tests									
Ravens matrices	-0.00	0.00	1740	0.03	5843	⟨0.78⟩	0.03	2701	⟨0.69⟩
	(0.10)	(0.09)		(0.05)			(0.07)		
Number series	-0.08	-0.10	1780	-0.02	5914	⟨0.37⟩	-0.06	2726	⟨0.77⟩
	(0.11)	(0.09)		(0.05)			(0.07)		
FE: Kabupaten	Yes	Yes		Yes			Yes		
FE: Gender	No	Yes		Yes			Yes		
FE: Age (decade)	No	Yes		Yes			Yes		
FE: Years of school	No	Yes		Yes			Yes		

Notes: Dependent variables in Panel (b) are indicators set to 1 if the interviewer considers the respondent's attention during the survey to be excellent, with interviewer fixed effects residualized out. All other dependent variables are standardized. Reported $\hat{\beta}_1$ coefficients includes the indicated fixed effects as well as a fixed effect for the assigned word list for rapid and delayed word recall. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. Column 6 reports the p-value on the F-test for equality of coefficients between columns 2 and 4. Column 9 reports the p-value on the F-test for equality of coefficients between columns 2 and 7. The analysis sample includes 1788 cardholder household heads and 5951 non-cardholder household heads. Missing data and dropped singletons account for small deviations in these values.

Table A6: Hidden heads: the only demographic subgroup within non-cardholder household heads that observe improvement in sleep quality is males who are 30 and over

	(1)	(2)	(3)
	SQI index (Std.)		p-value of
	$\hat{\beta}_1$	Obs.	diff. w/ heads
Non-head males 30 and older	0.42	160	$\langle 0.95 \rangle$
	(0.34)		

Notes: Column 1 reports the estimated impact on the standardized SQI index, $\hat{\beta}_1$, from a specification that includes gender, age decade, and kabupaten fixed effects on non-head males 30 and older. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. Column 3 reports the p-value on the F-test for equality of coefficients between members of the same demographic subgroup who are household heads.

Table A7: Impacts on savings, arisan contributions, and outstanding loans are qualitatively robust to variable value definition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	SP cardholder households				Non-cardholder households			
	$\hat{\beta}_1$	$\hat{\beta}_1$	Pre-transfer raw mean [sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer raw mean [sd.]	Obs.	p-value of difference
Panel a: Arisan (ROSCA) contributions last month (IDR 1 million)								
Log of values winsorized at 0.01	0.03**	0.03**	0.05	1780	0.02	0.10	5933	⟨0.40⟩
	(0.01)	(0.01)	[0.11]		(0.01)	[0.18]		
Made an arisan contribution last month (extensive margin)	0.01	0.00	0.41	1780	0.01	0.52	5933	⟨0.84⟩
	(0.06)	(0.06)	[0.49]		(0.05)	[0.50]		
Log of values winsorized at 0.01 for contributors (intensive margin)	0.06**	0.06**	0.12	788	0.01	0.20	3061	⟨0.07⟩*
	(0.03)	(0.03)	[0.15]		(0.02)	[0.21]		
Values	0.04**	0.04**	0.06	1780	0.03	0.15	5933	⟨0.83⟩
	(0.02)	(0.02)	[0.22]		(0.03)	[0.44]		
Log of values	0.03**	0.03**	0.05	1780	0.02	0.11	5933	⟨0.53⟩
	(0.01)	(0.01)	[0.13]		(0.02)	[0.21]		
Values winsorized at 0.01	0.04**	0.04**	0.06	1780	0.03	0.13	5933	⟨0.52⟩
	(0.02)	(0.02)	[0.15]		(0.02)	[0.26]		
Log of values winsorized at 0.02	0.03**	0.03**	0.05	1780	0.01	0.10	5933	⟨0.25⟩
	(0.01)	(0.01)	[0.11]		(0.01)	[0.17]		
Values winsorized at 0.02	0.04**	0.04**	0.06	1780	0.02	0.12	5933	⟨0.29⟩
	(0.02)	(0.02)	[0.14]		(0.02)	[0.23]		
Log of values winsorized at 0.05	0.03**	0.03**	0.04	1780	0.01	0.09	5933	⟨0.17⟩
	(0.01)	(0.01)	[0.10]		(0.01)	[0.14]		
Values winsorized at 0.05	0.03**	0.03**	0.05	1780	0.01	0.10	5933	⟨0.17⟩
	(0.01)	(0.01)	[0.12]		(0.01)	[0.17]		
Panel b: Household's outstanding loans (IDR 1 million)								
Log of values winsorized at 0.01	-0.12	-0.14*	0.49	1759	-0.10	0.71	5893	⟨0.68⟩
	(0.08)	(0.08)	[0.87]		(0.08)	[1.27]		
Has outstanding loans (extensive margin)	-0.06	-0.08	0.40	1759	-0.05*	0.36	5893	⟨0.61⟩
	(0.05)	(0.05)	[0.49]		(0.03)	[0.48]		
Log of values winsorized at 0.01 for loan holders (intensive margin)	-0.12	-0.13	1.24	712	0.03	1.95	2243	⟨0.45⟩
	(0.16)	(0.15)	[1.00]		(0.14)	[1.41]		
Values	-7.41*	-7.94*	4.84	1759	-5.27	10.53	5893	⟨0.46⟩
	(4.49)	(4.55)	[54.59]		(3.21)	[60.05]		
Log of values	-0.13	-0.15*	0.50	1759	-0.11	0.72	5893	⟨0.65⟩
	(0.09)	(0.08)	[0.90]		(0.08)	[1.30]		
Values winsorized at 0.01	-1.94**	-2.08**	2.35	1759	-1.77	7.06	5893	⟨0.86⟩
	(0.94)	(0.94)	[10.54]		(1.54)	[23.91]		
Log of values winsorized at 0.02	-0.12	-0.14*	0.49	1759	-0.10	0.70	5893	⟨0.67⟩
	(0.08)	(0.08)	[0.86]		(0.08)	[1.23]		
Values winsorized at 0.02	-1.45**	-1.56**	2.15	1759	-1.37	5.94	5893	⟨0.89⟩
	(0.73)	(0.73)	[7.81]		(1.16)	[17.54]		
Log of values winsorized at 0.05	-0.10	-0.13	0.48	1759	-0.08	0.66	5893	⟨0.64⟩
	(0.08)	(0.08)	[0.84]		(0.07)	[1.12]		
Values winsorized at 0.05	-0.75	-0.83*	1.85	1759	-0.61	3.73	5893	⟨0.74⟩
	(0.51)	(0.49)	[5.04]		(0.54)	[8.56]		
Panel c: Household's savings (IDR 1 million)								
Log of values winsorized at 0.01	0.11**	0.12**	0.14	1778	0.00	0.52	5923	⟨0.15⟩
	(0.05)	(0.05)	[0.43]		(0.07)	[1.05]		
Has savings (extensive margin)	0.03	0.04	0.18	1778	0.05	0.31	5923	⟨0.78⟩
	(0.04)	(0.04)	[0.39]		(0.03)	[0.46]		
Log of values winsorized at 0.01 for savers (intensive margin)	0.59***	0.45**	0.77	329	-0.23*	1.66	1850	⟨0.00⟩***
	(0.22)	(0.18)	[0.75]		(0.13)	[1.28]		
Values	1.13**	1.29**	0.39	1778	-2.94	5.85	5923	⟨0.03⟩**
	(0.51)	(0.58)	[2.00]		(1.90)	[41.49]		
Log of values	0.11**	0.13**	0.14	1778	-0.01	0.53	5923	⟨0.13⟩
	(0.05)	(0.05)	[0.43]		(0.07)	[1.09]		
Values winsorized at 0.01	0.84**	0.92***	0.39	1778	-0.79	3.48	5923	⟨0.02⟩**
	(0.33)	(0.34)	[2.00]		(0.69)	[11.44]		
Log of values winsorized at 0.02	0.11**	0.12**	0.14	1778	0.01	0.50	5923	⟨0.18⟩
	(0.05)	(0.05)	[0.43]		(0.07)	[0.99]		
Values winsorized at 0.02	0.74**	0.80***	0.39	1778	-0.43	2.84	5923	⟨0.03⟩**
	(0.30)	(0.30)	[2.00]		(0.51)	[8.15]		
Log of values winsorized at 0.05	0.10*	0.11**	0.14	1778	0.03	0.46	5923	⟨0.27⟩
	(0.05)	(0.05)	[0.42]		(0.06)	[0.88]		
Values winsorized at 0.05	0.46**	0.50**	0.35	1778	-0.07	1.80	5923	⟨0.09⟩*
	(0.21)	(0.21)	[1.59]		(0.28)	[4.21]		
FE: Kabupaten	Yes	Yes			Yes			
FE: Household characteristics	No	Yes			Yes			

Notes: Dependent variables are calculated as described measured in IDR 1 million. The reported $\hat{\beta}_1$ coefficient in column 1 only includes kabupaten fixed effects. Reported $\hat{\beta}_1$ coefficients in columns 2 and 5 are for a specification that includes fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the winsorized dependent variables, reported in columns 3 and 6, are calculated using the dependent variable values for the subset of pre-transfer observations interviewed prior to November 17 2014. Column 8 reports the p-value on the F-test for equality of coefficients between columns 2 and 5. The analysis sample includes 1788 cardholder households and 5951 non-cardholder households. Missing data and dropped singletons account for small deviations in these values.

Table A8: Heterogeneity by predicted household need: low need vs. mid need vs. high need SP cardholders

	(1)	(2)	(3)	(4)	(5)	(6)
	Low need		Mid need		High need	
Panel a: First stage	$\hat{\beta}_1$		$\hat{\beta}_1$		$\hat{\beta}_1$	
Received BLSM cash transfer	0.10**		0.12***		0.31***	
	(0.04)		(0.04)		(0.07)	
BLSM transfer amount (IDR 1 million)	0.03**		0.05***		0.13***	
	(0.01)		(0.02)		(0.03)	
Panel b: Household heads		Pre-transfer Mean [Sd.]		Pre-transfer Mean [Sd.]		Pre-transfer Mean [Sd.]
Standardized SQI index	0.38**		0.35**		0.67***	
	(0.16)		(0.15)		(0.19)	
Yesterday felt more than a little worried	-0.03	0.18	-0.07	0.22	-0.13*	0.22
	(0.07)	[0.39]	(0.05)	[0.41]	(0.07)	[0.41]
Yesterday felt more than a little frustrated	-0.06	0.13	-0.07*	0.12	-0.01	0.13
	(0.07)	[0.34]	(0.04)	[0.33]	(0.05)	[0.34]
Yesterday felt more than a little tired	-0.14	0.46	-0.05	0.46	-0.13	0.46
	(0.09)	[0.50]	(0.06)	[0.50]	(0.09)	[0.50]
Rapid word recall	0.13		0.11		0.24	
	(0.19)		(0.11)		(0.16)	
Delayed word recall	-0.01		0.20*		0.27	
	(0.15)		(0.10)		(0.17)	
Enumerator rated attention as excellent	-0.04		0.11***		0.04	
	(0.04)		(0.04)		(0.04)	
Panel c: Household variables						
Made arisan contributions last month	-0.05	0.42	-0.00	0.42	0.09	0.38
	(0.10)	[0.49]	(0.09)	[0.49]	(0.12)	[0.49]
Log arisan contributions last month (IDR 1 million)	0.04	0.08	0.02	0.05	0.05**	0.05
	(0.03)	[0.19]	(0.02)	[0.11]	(0.02)	[0.18]
Has household savings	0.11	0.21	0.02	0.16	0.00	0.18
	(0.08)	[0.41]	(0.06)	[0.37]	(0.07)	[0.39]
Log household savings (IDR 1 million)	0.28**	0.70	0.08	0.19	0.01	0.48
	(0.11)	[2.88]	(0.07)	[0.89]	(0.10)	[2.40]
Has outstanding loans	-0.01	0.31	-0.13*	0.39	-0.05	0.51
	(0.07)	[0.46]	(0.07)	[0.49]	(0.10)	[0.50]
Log outstanding loans (IDR 1 million)	-0.09	2.92	-0.20*	1.60	-0.20	3.87
	(0.16)	[16.96]	(0.11)	[4.20]	(0.18)	[17.06]
N	450		870		458	

Notes: Estimates are presented for subsets of the main sample by predicted household need. Households are categorized into low, mid and high need households using their predicted SP cardownership and the following thresholds: Low need if $E[\textit{has SP card}] < 0.35$; mid need if $0.35 \leq E[\textit{has SP card}] \leq 0.6$; and high need if $E[\textit{has SP card}] > 0.6$. Reported $\hat{\beta}_1$ coefficients are for a linear specification that includes the same set of fixed effects used for that dependent variable in the main paper: these include kabupaten fixed effects for the first stage, for individual specifications these include age decade, gender, and kabupaten fixed effect with the addition years of education for cognitive outcomes, affect list for affect outcomes and the word list assigned for the word recall outcomes. For household variables fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten are included. The value of arisan contribution, loans and savings are calculated as $Log(Y + 1)$ where Y is the value measured in IDR 1 million and winsorized at the 1% level. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01.

Table A9: No statistically significant improvement in mental health – as measured by the CES-Depression scale – for cardholder household heads just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Heads SP cardholders			Heads non-cardholders				Non-head SP cardholders			
	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference
Standardized value of CES-D	-0.14	0.16	1786	0.13**	-0.05	5951	⟨0.01⟩***	0.02	0.25	2739	⟨0.20⟩
	(0.11)	[1.06]		(0.06)	[0.98]			(0.09)	[1.03]		

Notes: Dependent variables are the standardized scores on the 10 item CES-D mental health questionnaire. Reported $\hat{\beta}_1$ coefficients in columns 1, 4 and 8 are for a linear regression discontinuity specification that includes kabupaten, age decade, and gender fixed effects. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2, 5 and 9, are calculated using the subset of pre-transfer observations interviewed prior to November 17 2014. Column 7 reports the p-value on the F-test for equality of coefficients between columns 1 and 4. Column 11 reports the p-value on the F-test for equality of coefficients between columns 1 and 8. 2 singleton observations were dropped in Column 1 and 8.

Table A10: No statistically significant change in asset values that include sleeping aids for cardholder households just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	SP cardholder households			Non-cardholder households			
	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference
Panel a: Log household expenditures last month (IDR 1 million)							
Electricity	0.00	0.05	1780	0.01	0.08	5933	⟨0.46⟩
	(0.01)	[0.06]		(0.01)	[0.10]		
Fuel	-0.00	0.04	1780	-0.01*	0.04	5933	⟨0.49⟩
	(0.00)	[0.04]		(0.00)	[0.05]		
Personal toiletries	0.00	0.05	1780	0.00	0.07	5933	⟨1.00⟩
	(0.01)	[0.06]		(0.01)	[0.09]		
Household items	-0.00	0.04	1780	0.00	0.04	5933	⟨0.36⟩
	(0.00)	[0.04]		(0.00)	[0.04]		
Panel b: Log household expenditures last year (IDR 1 million)							
Household supplies and furniture	-0.04	0.15	1780	-0.01	0.29	5933	⟨0.47⟩
	(0.03)	[0.57]		(0.02)	[0.83]		
Misc. annual expenditures	0.01	0.66	1780	-0.02	2.68	5933	⟨0.67⟩
	(0.06)	[2.57]		(0.05)	[10.66]		
Panel c: Log value of household's reported assets (IDR 1 million)							
Appliances	0.04	1.81	1780	-0.03	4.01	5935	⟨0.32⟩
	(0.06)	[2.72]		(0.06)	[5.24]		
Furniture and utensils	0.01	2.03	1777	0.01	4.39	5929	⟨0.93⟩
	(0.05)	[2.49]		(0.06)	[5.67]		

Notes: Dependent variables are calculated as $Log(Y+1)$ where Y is the value measured in IDR 1 million and winsorized at the 1% level. Reported $\hat{\beta}_1$ coefficients in columns 1 and 4 are for a linear regression discontinuity specification that includes fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2 and 5, are calculated using the subset of pre-transfer observations interviewed prior to November 17. Column 7 reports the p-value on the F-test for equality of coefficients between columns 1 and 4. The questionnaire lists examples of items for broad expenditure categories. Particularly relevant examples listed in the questionnaire include anti-mosquito items in the monthly household items category; bed sheets in the annual household supplies and furniture category; and beds in the miscellaneous annual expenditures category.

Table A11: No statistically significant change in other assets and expenditures for cardholder households just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	SP cardholder households			Non-cardholder households			
	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference
Panel a: Log household expenditures (IDR 1 million)							
Other monthly non-food expenditures	0.03	0.35	1780	-0.02	0.73	5933	⟨0.17⟩
	(0.03)	[0.90]		(0.03)	[1.44]		
Other annual expenditures	-0.01	2.70	1780	-0.02	4.60	5933	⟨0.94⟩
	(0.07)	[4.45]		(0.05)	[6.66]		
Panel b: Log value of other household assets (IDR 1 million)							
Other belongings	-0.14	6.36	1782	-0.07	21.44	5946	⟨0.59⟩
	(0.11)	[9.28]		(0.10)	[44.43]		
Panel c: Earnings							
Log household earnings (IDR 1 million)	-0.10	34.21	1782	-0.13*	50.11	5947	⟨0.73⟩
	(0.09)	[42.48]		(0.07)	[62.53]		

Notes: Dependent variables are calculated as $Log(Y+1)$ where Y is the value measured in IDR 1 million and winsorized at the 1% level. The reported $\hat{\beta}_1$ coefficient in column 1 are for a specification that includes fixed effects for the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2 and 5, are calculated using the subset of pre-transfer observations interviewed prior to November 17. Column 7 reports the p-value on the F-test for equality of coefficients between columns 1 and 4. Other monthly non-food expenditures include expenditures on recreation, sweepstakes, transportation, water, phones, servants and regular monthly transfers. Other annual expenditures include expenditures on clothing, medical care, ceremonies, taxes and irregular transfers. Other belongings include the value of jewelry, receivables, vehicles, hard-stem plants, livestock, poultry, and the unlisted category.

Table A12: No statistically significant change in nutrition indicators for cardholder households or household heads just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	SP cardholder households			Non-cardholder households			
	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference
Panel a: Log of household food consumption last week (IDR 1 million)							
Food consumption	-0.02	0.35	1781	-0.00	0.45	5933	$\langle 0.42 \rangle$
	(0.02)	[0.24]		(0.01)	[0.34]		
... Alcohol consumption	-0.00	0.00	1781	0.00	0.00	5927	$\langle 0.15 \rangle$
	(0.00)	[0.01]		(0.00)	[0.01]		
... Cigarette consumption	-0.00	0.04	1765	0.00	0.05	5898	$\langle 0.75 \rangle$
	(0.01)	[0.06]		(0.00)	[0.07]		
... Betel nut consumption	-0.00	0.00	1781	0.00	0.00	5931	$\langle 0.06 \rangle$*
	(0.00)	[0.01]		(0.00)	[0.01]		
Panel b: Food consumption of household head							
Meals per day	0.00	2.60	1773	-0.05	2.67	5890	$\langle 0.35 \rangle$
	(0.05)	[0.53]		(0.04)	[0.51]		
Reports adequate food consumption	0.00	0.73	1786	-0.03	0.87	5950	$\langle 0.42 \rangle$
	(0.04)	[0.44]		(0.02)	[0.33]		

Notes: Dependent variables in panel (a) are calculated as $Log(Y + 1)$ where Y is the value measured in IDR 1 million. Meals per day is a continuous variable and reporting adequate food consumption is an indicator set to 1 if the respondent reports that their food consumption is adequate or more than adequate for their needs. Reported $\hat{\beta}_1$ coefficients in columns 1 and 4 are for a linear regression discontinuity specification. Fixed effects for panel (a) include the number of household members, the number under 16 years of age, the number over 65 years of age, the number of female household members, if the household head is female and the household's kabupaten. Fixed effects for panel (b) include gender, age decade and kabupaten fixed effects. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2 and 5, are calculated using the subset of pre-transfer observations interviewed prior to November 17. Column 7 reports the p-value on the F-test for equality of coefficients between columns 1 and 4.

Table A13: No statistically significant change in rise time, bed time, and hours worked for cardholder household heads just after the BLSM cash transfer disbursement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Heads SP cardholders			Heads non-cardholders				Non-head SP cardholders			
	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference	$\hat{\beta}_1$	Pre-transfer Mean [Sd.]	Obs.	p-value of difference
Rise time yesterday (hrs.)	0.02	5.06	1774	0.04	5.01	5926	⟨0.95⟩	0.12	5.23	2730	⟨0.64⟩
	(0.18)	[2.21]		(0.14)	[2.31]			(0.17)	[2.20]		
Bed time yesterday (hrs.)	0.20	22.30	1771	-0.07	22.42	5923	⟨0.14⟩	0.20	22.02	2724	⟨0.99⟩
	(0.16)	[2.05]		(0.10)	[2.08]			(0.15)	[2.12]		
Work hours last week	0.89	34.34	1786	3.27**	34.63	5951	⟨0.37⟩	-1.42	22.42	2739	⟨0.47⟩
	(2.35)	[27.00]		(1.53)	[28.05]			(2.27)	[27.11]		

Notes: Work hours last week is winsorized at the 1 percent level. Reported $\hat{\beta}_1$ coefficients in columns 1, 4, and 8 are for a linear regression discontinuity specification that includes gender, age decade, and kabupaten fixed effects. Standard errors are reported in parentheses, clustered at the enumeration area level, with the following significance indicators: * p<0.1, ** p<0.05 and ***p<0.01. The mean and standard deviations of the dependent variables, reported in columns 2, 5 and 9, are calculated using the subset of pre-transfer observations interviewed prior to November 17. Columns 7 and 11 reports the p-value on the F-test for equality of coefficients with cardholder household heads; that is, between columns 1 and 4, and 1 and 8, respectively.