

Examining the impact of the Good Behaviour Game on health- and education-related outcomes for children: a cluster RCT and cost-consequence analysis

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Scientific Summary

Background

Children's behaviour in primary schools in England is mostly very good. Despite this, it is estimated that up to an hour of learning is lost each day as a consequence of low-level disruption in the classroom (e.g. fidgeting, calling out). Universal behaviour management interventions such as the Good Behaviour Game (GBG) aim to prevent disruptive behaviour in the classroom, with consequent improvements in a range of health- and education-related outcomes.

The core components of the GBG are classroom rules, team membership, monitoring behavior and positive reinforcement. In brief, children work in teams to win the game in order to access agreed rewards. It is played alongside a normal classroom activity for a specified period of time, during which the teacher monitors infractions to four rules: (1) we will work quietly; (2) we will be polite to others; (3) we will get out of our seats with permission; and (4) we will follow directions. Teams with four or fewer infractions at the end of the game win and are rewarded. Over time, the GBG evolves in terms of the frequency and duration of play, and the nature and timing of rewards. Teachers implementing the GBG are supported by external coaches, who model game sessions, observe and provide feedback on implementation, offer ad-hoc email and telephone support, and provide additional/booster training or information sessions as required.

The intervention has an impressive international evidence base. There have been fourteen randomized trials of the GBG spanning seven countries. Among those that have reported findings at the intent-to-treat level, and the specific effects of the intervention can be isolated, most note significant effects on behavioural and other outcomes. The size of these effects is generally in line with those reported in meta-analytic studies of universal behaviour management interventions. However, there are some notable exceptions to this trend that report null results. Furthermore, relatively little is known about the medium- and long-term effects of the GBG, or the potential moderating role of implementation compliance.

The GBG is a promising intervention, but prior to the current study, it has never been rigorously evaluated in England. We report findings from the first randomized controlled trial of the intervention in English primary schools, addressing a number of significant gaps in the evidence base.

Objectives

1. To determine the impact of the GBG on health- and education-related outcomes for children
2. To determine the impact of the GBG on a variety of outcomes for boys at-risk of developing conduct problems

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3. To determine the extent to which the effects of the GBG vary as a function of intervention compliance (dosage)
4. To determine whether the effects of the GBG are sustained (or emerge) over time
5. To assess the temporal association between mental health and academic attainment
6. To assess the health economic impact of the GBG

Methods

A two-group parallel cluster randomised controlled trial design was utilised, with schools as the unit of randomisation. Schools allocated to the intervention arm of the trial implemented the GBG throughout the school years 2015/16 and 2016/17. Those allocated to the usual practice (UP) arm of the trial continued their existing approaches to managing behaviour during this period. The random allocation of schools was conducted independently of the authors by the Clinical Trials Unit at the Manchester Academic Health Science Centre, and was balanced by school size and the proportion of children eligible for free school meals via minimisation.

Intervention

The core components of the GBG are classroom rules, team membership, monitoring behavior and positive reinforcement. In brief, children work in teams to win the game in order to access agreed rewards. It is played alongside a normal classroom activity for a specified period of time, during which the teacher monitors infractions to four rules: (1) we will work quietly; (2) we will be polite to others; (3) we will get out of our seats with permission; and (4) we will follow directions. Teams with four or fewer infractions at the end of the game win and are rewarded. Over time, the GBG evolves in terms of the frequency and duration of play, and the nature and timing of rewards. Teachers implementing the GBG are supported by external coaches, who model game sessions, observe and provide feedback on implementation, offer ad-hoc email and telephone support, and provide additional/booster training or information sessions as required.

Participants

Participants were children ($n = 3084$) in Year 3 (aged 7-8) attending 77 participating primary schools (38 GBG; 39 usual practice).

Outcome measures

Immediate post-intervention outcomes assessed were children's conduct problems (primary outcome – assessed via the teacher-rated Strengths and Difficulties Questionnaire, SDQ), psychological wellbeing (self-report Kidscreen survey), emotional symptoms (teacher-rated SDQ), peer and social support (self-report Kidscreen

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survey), school environment (self-report Kidscreen survey), school absence (National Pupil Database records), bullying (social acceptance) (self-report Kidscreen survey), and exclusion from school (National Pupil Database records). Academic attainment (reading, assessed via standardised tests), disruptive behaviour, concentration problems, and pro-social behaviour (assessed by the Teacher Observation of Child Adaptation Checklist) were also collected in the 2-year follow-up period.

The primary outcome was assessed at baseline, post-intervention, and at 12- and 24-month follow-up. Secondary outcome measures were assessed at post-intervention, and at 12- and 24-month follow-up.

In addition, data on intervention compliance (dosage) were collected throughout the two-year intervention period.

Results

There was no evidence that the GBG led to improvements in any of the above outcomes immediately after the intervention period (Objective 1). The only significant subgroup moderator effect identified was contrary to expectations: at-risk boys in GBG schools reported *higher* rates of bullying at the end of the intervention period (ES = -0.563, CI -0.716 to -0.409) (Objective 2). The evidence that intervention outcomes were moderated by the amount of time spent playing the GBG was minimal and somewhat conflicting; in the context of both moderate (≥ 1030 minutes) and high (≥ 1348 minutes) intervention compliance, there were significant *negative* effects on children's psychological wellbeing (moderate compliance ES = -0.241, CI -0.312 to -0.170; high compliance ES = -0.294, CI -0.365 to -0.223), but significant *positive* effects on absence (moderate compliance IRR = 0.519, CI 0.450 to 0.598; high compliance IRR = 0.510, CI 0.371 to 0.701) (Objective 3). There was no evidence of the emergence of intervention effects at 12-month or 24-month follow-up on any outcomes, with the exception of a potentially negative effect on peer and social support (ES = -0.195, CI -0.265 to -0.125) (Objective 4). After disaggregating within- and between-individual effects, we found no temporal within-individual associations between children's mental health and their academic attainment (Objective 5). Finally, our cost-consequence analysis indicated that the GBG does not provide value for money, with implementation costs of £275.68 per child, no attendant difference found in primary or secondary outcomes, and no difference in exclusion costs (Objective 6).

Conclusions

On the basis of the findings reported here, it is not possible to recommend the GBG as a way to improve children's health- and education-related outcomes. However, we note that intervention compliance was suboptimal, and even though our analyses indicated that outcomes mostly did not vary as a function of dosage, we cannot rule out the possibility that a minimum effective dose was not reached, even in our high compliance

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settings. Nonetheless, the dosage reported was achieved in an efficacy trial context in which initial training and ongoing coaching support for teachers, subsidised intervention costs for schools, additional provision for data monitoring made available by our research team, and developer support for the delivery team, were all available. In other words, while we *may* have seen more evidence of meaningful intervention effects with significantly higher levels of implementation than were observed here, it is very unlikely that such levels would ever be achieved were the GBG to be implemented at scale in England, when such a comprehensive implementation support system would be absent.

Other possible explanations for our results include cultural incompatibility and insufficient programme differentiation. In relation to the former, many teachers reported struggling with certain mandated intervention procedures, most notably not being able to directly interact or intervene with pupils during gameplay. With regard to the latter, our survey of teachers' behaviour management strategies revealed that those in the control arm of the trial were enacting practices that mirrored some of the core components of the GBG (e.g. classroom rules, team membership, monitoring behaviour and positive reinforcement). Given this, it is possible that the null results observed were due to the fact the intervention was insufficiently differentiated from the usual practice of schools.

The findings of this study raise a number of questions that future research might usefully seek to answer. Below we outline some key gaps and provide an indication of what future studies might look like in order to address these:

- *Who benefits from higher levels of dosage of interventions like the GBG?* To address this question, future research should incorporate extensions of complier average causal effect models (which account for implementation variability) to include subgroup moderator analyses (which facilitate examination of differential gains among specified groups within a trial sample)
- *Does the level of differentiation between the GBG and existing behaviour management practices in the classroom matter?* To address this question, future research should examine whether the magnitude of intervention effects vary by level of programme differentiation. One might, for example, predict larger effects in 'high differentiation' settings, where the constituent components of the GBG are novel, than in 'low differentiation' settings in which they are less distinct from existing practice.
- *Is the GBG impactful if it is delivered in combination with another intervention(s)?* To address this question, future research should use factorial trial designs, which enable the examination of an interaction between two or more interventions (e.g. control; GBG only; other intervention only; GBG + other intervention in combination)
- *Do interventions like the GBG impact on the developmental process of growth?* To address this question, future research should use growth curve models (as opposed to point-in-time estimates) that can examine the impact of interventions like the GBG on developmental trajectories.

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Public and Patient Involvement

The Director of Common Room and a team of six Young Research Advisors undertook a range of activities throughout the study, including attendance at and contribution to trial steering committee meetings; input and feedback on a range of study materials (e.g. child self-report surveys, standardized survey instructions, debriefs), and dissemination outputs (e.g. short film on YouTube to present project findings in an accessible manner to non-academic audiences); and, focus groups in schools to discuss the experiences of children who had taken part in the GBG.

Trial registration

This trial is registered as ISRCTN64152096.

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