The effectiveness and cost-effectiveness of the Incredible Years® Teacher Classroom Management programme in primary school children: results of the STARS cluster randomised controlled trial with parallel economic and process evaluations

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Scientific Summary

Background

Extremely challenging behaviour that interferes with a child's ability to engage in normal social and educational settings is relatively common. Between 5% and 6% of primary aged children, or 1 or 2 children in the average school classroom, will display behaviours that reduce their ability to function, while conduct disorder is one of the strongest predictors of later adult mental health difficulties. Poor behaviour not only affects the individual child's ability to engage with education, but it can also disrupt the learning of the remaining children in their class. Teachers report that managing challenging behaviour can be a cause of additional stress in their role and that their initial training did not provide enough practical support for them to feel confident in their ability to control and engage their class. In the Supporting Teachers And childRen in Schools (STARS) trial we wanted to find out if the Incredible Years® (IY) Teacher Classroom Management (TCM) training programme could help teachers improve the behaviour of the children in their classes. There is a lot of previous research that shows the corresponding parent and child IY training programs are very effective, but the TCM training had not yet been tested in isolation in UK schools in a large randomised trial.

TCM training is delivered to groups of 12 teachers over six full days spread over six months, a format which enables teachers to practice the new strategies they have learned between sessions. TCM has four explicit goals:

- Enhance teacher management skills and improve teacher-pupil relationships
- Assist teachers to develop effective individual and group behaviour plans in order to enable proactive (as opposed to reactive) classroom management
- Encourage teachers to adopt and promote social and emotional regulation skills
- Encourage teachers to strengthen positive teacher-parent relationships

TCM uses a range of methods to deliver the training of these four principles and is based on cognitive social learning theory as well as several theoretical perspectives that are widely used in developmental psychology.

Objectives

To determine if TCM is an effective universal intervention for improving children's mental health in the context of the UK primary school system.

Secondary objectives included examining whether access to TCM training:

- improved teachers' mental health, professional self-efficacy and reduced their burn out
- improved children's academic attainment and classroom-based behaviour
- improved children's happiness in school and behaviour at home
- was cost-effective in relation to potential improvements in children's mental health
- impacted teachers' practice in the classroom and what factors supported or hindered these potential changes

Methods

STARS was a two-arm, pragmatic, cluster randomised controlled trial designed to evaluate whether the TCM course (delivered at class level) improves the mental health of individual children. We recruited 80 primary schools across the South West of England between May 2012 and July 2014, one class (teacher and all pupils) was selected by the headteacher. Schools were randomised with 40 of the class teachers receiving TCM training (intervention) and 40 being asked to continue teaching as usual (TAU - control).

Schools were eligible for inclusion if they had a single-year class with 15 or more children aged between four and nine years who were taught by a teacher who held classroom responsibility for at least four days per week. Schools were excluded if they primarily taught pupils with special educational needs, lacked a substantive headteacher, or were judged as failing in their last OFSTED inspection. All children in the selected classes were eligible for inclusion provided the class teacher judged that they and their parents had sufficient English language comprehension to understand recruitment information and complete outcome measures.

Written consent was obtained from the headteacher for the school's participation and from the class teacher for their involvement. Parent information leaflets were sent home with children and parents were given two weeks to "opt-out" their child from the research. Verbal assent was obtained from children each time they were asked to complete a questionnaire.

Outcome measures were collected on four occasions: baseline measures were collected in October, and follow-up measures were collected 9- (June), 18- (February) and 30- (February) months later. Baseline and 9-month assessments took place during the first academic year of participation, before and after the intervention respectively, so were completed by the same teacher. The 18-month and 30-month assessments were completed by different teachers.

At each assessment point we asked teachers and parents to complete the Strengths and Difficulties (SDQ) questionnaire which measures children's mental health. The SDQ measure provides a Total Difficulties (SDQ-TD) score comprised of a total of the Behaviour, Emotions, Inattention/Overactivity, and Peer relationships subscale scores, as well as Pro-Social and Impact scores. Higher scores indicate poorer mental health except for the Pro-Social subscale. Our primary outcome was the teacher-completed SDQ-TD score. In addition, we asked teachers to complete the Pupil Behaviour Questionnaire (PBQ), which measures children's classroom-based disruptive behaviours, and rate each child's academic progress in literacy and numeracy. Parents were also asked to complete a brief questionnaire about their child's use of key NHS services. Children were asked to complete the How I Feel About My School measure (HIFAMS) which assesses children's attitudes towards school, with higher scores indicating greater happiness. We also linked to the National Pupil Database (NPD) so we could obtain accurate records of attendance for all included children.

Researchers who did not know which teachers had attended TCM training observed lessons in just over a quarter of the schools. They were recording behaviours that are specifically targeted in TCM training. We met with teachers in focus groups and asked them to say in their own words if they felt anything had changed in their approach to teaching and what impact, if any, this had had on the children they teach and other staff and parents.

The trial outcomes at follow-up were compared using the intention-to-treat principle. We used random effects regression models to compare the intervention and control children, allowing for the similarity of data (clustering) within one class of children as compared with a different class of children.

We tested to see if the effect of TCM training might be stronger or weaker for children falling into subgroups based on: school or child level deprivation status (in bottom two deciles versus otherwise), whether the child scored in the struggling range on the teacher-reported SDQ-TD score at baseline, length of study teacher's experience (more than five years versus five years or less), KS status (KS1 versus KS2), child's gender and cohort status (Cohort 1, 2 or 3). Given the relationship between emotional health and educational progress, we also explored whether any effect of the intervention on the educational progress was modified by whether the child had scored in the struggling range on the teacher-reported SDQ Total Difficulties score at baseline.

This study was granted ethical approval by The Peninsula College of Medicine and Dentistry Research Ethics Committee, now under the auspices of The University of Exeter Medical School Committee on 8/3/12 reference number 12/03/141. The University of Exeter acted as the Sponsor for the study. The trial was registered with the International Standard Randomised Controlled Trial Register with the reference number ISRCTN84130388 and funded by National Institute for Health Research Public Health Research Programme (10/3006/07) and the NIHR CLAHRC South West Peninsula. All of the information collected was kept strictly confidential and held in accordance with the principles of the Data Protection Act.

Results

A total of 2075 children were recruited to the trial (1037 in the TCM arm and 1038 in the TAU arm). A further 113 were either opted out by their parents (107) or ineligible (6). We lost contact with 271 (13%) children over the 30-month follow-up period and two parents withdrew permission for parent-reported outcomes but permitted collection of teacher- and child-reported outcomes. During the trial some schools did not provide teacher-completed data on child outcomes at the 9-month (n=1), 18-month (n=2), and 30-month (n=1) assessments. In addition, one intervention school withdrew from the trial after completing the 18-month assessment. Primary outcome data were collected at 9-, 18-, and 30-months follow-up for 96%, 89%, and 85% of participants, respectively. Thirty-six (90%) of the 40 teachers in the intervention arm attended four or more TCM sessions; 23 (58%) attended all six.

We found that TCM improved child mental health, according to the teacher-reported SDQ-TD score, by 1.0 point (95% CI: 0.1 to 1.9; p=0.03) at the 9-month follow-up. There was little evidence, however, of an effect at the 18-month (p=0.85) and 30-month follow-ups (p=0.23).

Tests of interaction indicated that TCM led to greater reductions in the teacher-reported SDQ-TD score at 9-months (interaction p<0.001) for children who were classified by their teacher as struggling with their mental health at baseline (mean difference = -2.6; 95% CI: -4.6 to -0.6) than for children who were not (mean difference = -0.4; 95% CI: -1.2 to 0.4). A subgroup effect was also found at 30-months (p<0.001) but not 18 months (p=0.10).

There was evidence, based on the PBQ score, of reduced disruptive behaviour across all 30-months of follow-up (p=0.04). Likewise, there was evidence that TCM reduces the percentage of children that are classified as struggling according to the SDQ-TD score (p=0.05) and reduces the Inattention/Overactivity score (p=0.02) across all the full 30 month follow-up. At 9-months only there was also evidence of a reduction in peer relationship problems (p=0.02) and an improvement in pro-social behaviour (p=0.02). Finally, there was little evidence of effects on teacher-reported emotions and impact, assessment of pupils' progress (APP), parents' assessment of their child's mental health or the child-reported outcome HIFAMS.

There was little evidence that the intervention had any effect on either the rate of overall absence during either the first (adjusted rate ratio=1.08; 95% CI: 0.95 to 1.24; p=0.24) or second (adjusted rate ratio=1.10; 95% CI: 0.72 to 1.70; p=0.65) year of the trial; or the number of unauthorised absences during the first (adjusted rate ratio=1.03; 95% CI: 0.90 to 1.18; p=0.62) or second (adjusted rate ratio=0.96; 95% CI: 0.75 to 1.22; p=0.74) year of the trial. School exclusions were reported on 22 separate occasions, two in the intervention arm and 20 in the control arm, which resulted in a total loss of 64 school sessions, three sessions in the intervention arm and 61 sessions in the control arm. These exclusions were issued to a total of six children, two from the intervention and four from the control arm of the trial.

Although there was no overall effect of the intervention on academic progress in either literacy or numeracy, sub-group analysis did indicate that the intervention's effect differed between those who were and were not classified by their teacher as struggling with their mental health at baseline for both literacy (interaction p = 0.04) and numeracy (interaction p = 0.03). The intervention arm had lower odds than the control arm of below expectations assessments in literacy (OR=0.77; 95% CI: 0.53 to 1.12) and numeracy (OR=0.82; 95% CI: 0.59 to 1.14) amongst those not classified as struggling, whereas it had greater odds of below expectations assessments for literacy (OR=1.17; 95% CI: 0.70 to 1.94) and numeracy (OR=1.35; 95% CI:

0.88 to 2.06) amongst those who are classified as struggling. This suggests that children who were classified as struggling performed worse in the intervention than the control arm, whereas children who were not classified as struggling performed better in the intervention than the control arm. However, all four of these confidence intervals include unity, so it is difficult to interpret these findings, other than to comment that there seems to be a differential effect according to baseline mental health.

Cost of the TCM course was calculated to be £11.52 per child and was applied to the intervention arm. Observed mean total costs of services used over the 30-month follow-up period were very slightly lower for the intervention arm (£524.16) compared to the control arm (£528.14). However, this difference was not statistically significant (adjusted mean difference: £30.24, 95% CI: -£140.98 to £201.47, p-value=0.7). For the primary cost-effectiveness analysis using the SDQ-TD score, the lower costs and better outcomes in the intervention group generate an ICER of -£19.90 per unit improvement in SDQ-TD and suggested that the probability of TCM being cost-effective compared to TAU was associated with some uncertainty (range 40% to 80% dependent on the willingness to pay for a unit improvement in SDQ-TD score). In terms of quality adjusted life-years (QALYs), there was evidence to suggest that TCM was cost-effective compared to TAU at the NICE thresholds of £20,000-30,000 per QALY at 9-months and 18-months follow-up, but not at 30-months.

There was little evidence that TCM had any impact on teachers' self-efficacy, burn-out and wellbeing scores. However, teachers did say that they felt the TCM training had helped them in other ways, including helping them see things from the child's point of view and improving their relationship with the children and helping themselves feel more positive, confident and in control. In addition, we demonstrated, in those schools where researchers observed lessons, teachers' behaviour had changed following training: teachers used more praise and were more positive in their behaviour towards the children.

Conclusions

We detected a small but statistically significant improvement in teacher-reported children's mental health at 9-months (SDQ-TD). The findings provide tentative evidence that TCM may provide teachers with strategies that impact on children's mental health, and while small, the effect detected suggests that this intervention could usefully be tested further. Our planned

subgroup analyses suggest that children with poorer mental health at baseline derived the most benefit according to teacher report.

Economic evaluation, carried out at the 30-month follow-up using the SDQ-TD, suggests that TCM may be cost-effective compared to TAU however it was not possible to draw a firm conclusion without knowing society's willingness to pay for improvements in SDQ-TD score. In terms of QALYs, there was evidence to suggest TCM was cost-effective compared to TAU in the short-term, but not at the 30-month follow-up.

The effect of TCM on the primary outcome was not maintained at 18 and 30 months which could mean that TCM has no longer term impact, or be due to the children's reaction to the teaching style of their subsequent teachers who had not accessed TCM training. Most effective universal programmes employ a whole school approach, and the findings from this study would suggest that training all school staff to use the same strategies might amplify and sustain any initial impact on children's mental health that training a single teacher might have.

The small but sustained effects on disruptive behaviour and inattention/hyperactivity as measured by the teacher SDQ across all three follow-ups are interesting and warrant replication. The linkage to the National Pupil Database demonstrated some interesting differences in relation to exclusion between the trial arms, which suggest that these data may provide a useful vehicle through which to conduct longer term follow-up of the STARS participants.

We did not detect an intervention effect on parent reported measures, but this was not unexpected. Children respond differently in different situations and TCM targets classroom behaviour rather than behaviour at home.

In our process evaluation, teachers reported that children were calmer, more motivated and more ready to learn, however, these reported experiences did not translate into empirical evidence of an improvement in academic attainment at a universal level. The interaction with baseline mental health, which is difficult to interpret in terms of direction, is interesting and suggests that the impact on attainment is worth studying in more depth. It is intuitively plausible that a more settled classroom would allow accelerated progress for children who were

otherwise thriving. Given the crudeness of the measure available to us, we were not surprised that there was no main effect detected on attainment.

Implications and directions for future research

1) The findings of the STARS trial provide strong evidence that TCM is feasible and acceptable in the UK context
2) Our findings provide early evidence that TCM may be an effective universal child mental health intervention in the short term, particularly for children who are struggling
3) TCM should be explored as a whole school approach
4) TCM's impact on teachers' relationship with children and academic progress should be evaluated