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Education and Health

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Welcome to the third issue for 2012. We continue the proud tradition of independent publishing and offer an eclectic mix of articles: School management, in different countries, of students with a lack of sleep; Gambling and video gaming; School-based drama; Water in schools; Musical games and empathy.

The journal, published since 1983, is aimed at those involved with education and health who are concerned with the health and wellbeing of young people. Readers come from a broad background and include: primary, secondary and further education teachers, university staff, and health-care professionals working in education and health settings. The journal is also read by those who commission and carry out health education programmes in school and college.

Articles focus on recent health education initiatives, relevant research findings, materials and strategies for education and health-related behaviour data.

Contributors

Do you have up to 3000 words about a relevant issue that you would like to see published? Please contact david.mcgeorge@sheu.org.uk

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'Education and Health' is published by SHEU, an independent organisation, providing research, survey and publishing services to those concerned with the health and social development of young people. SHEU incorporates the Schools Health Education Unit, founded in 1977 by John Balding.

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Editorial
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School management of students with a lack of sleep

The Schools Health Education Unit have been collecting school data since 1977. Following publication of the latest report, *Young People into 2012* (SHEU, 2012) some of the media reported that:

" Many teenagers do not believe they are getting enough sleep to remain alert at school and stay healthy, research suggests. It reveals girls are more concerned about their sleeping habits than boys, and that youngsters are more likely to say they are not getting enough as they get older. More than one in four 14 and 15-year-old girls (28%), and just over a fifth of boys of the same age (22%) do not think they sleep enough to concentrate on their studies, according to the Schools Health Education Unit. Their findings, drawn from surveys of thousands of schoolchildren aged from 10 to 15, show that fewer 12 and 13-year-olds (Year 8) are concerned about lack of sleep affecting their classwork. A fifth (20%) of Year 8 girls, and 16% of boys said that the amount of sleep they normally get is not enough for them to stay alert and concentrate on lessons. The research shows the proportions of youngsters who are concerned about the impact lack of sleep has on their health, with 17% of 12 and 13-year-old boys and the same number of girls saying they don't think get enough to stay healthy. This rose to 22% among 14 and 15-year-old boys (Year 10) and 27% of girls of the same age. Overall, 80% of Year 8 boys and 78% of Year 8 girls said that they get eight hours or more sleep a night, this fell 65% for Year 10 boys and girls." (Press Association, 2012).

Research by Warwick Medical School has found that sleep deprivation is associated with an almost a two-fold increased risk of being obese for both children and adults. The research reviewed current evidence in over 28,000 children and 15,000 adults. The research also suggests that those who sleep less have a greater increase in body mass index and waist circumference over time. These trends are detectable in adults as well as in children as young as 5 years (Warwick, 2012).

School management

How do schools manage students with a lack of sleep? In September 2007, about 300 pupils aged between 14 and 18 at Hugh Christie Technology College in Kent, started school three days a week at 11.30am and finishing at 5.30pm. The Headteacher said, "Their (the pupils') punctuality and attendance has improved, their questioning and answering is better because they are more alert and the pace of lessons is often much quicker," (Guardian, 2009).

Monkseaton High School in North Tyneside in the UK has worked with Russell Foster, Professor of Circadian Neuroscience at Brasenose College, Oxford University, on teenagers' body-rhythms. Pupils have been given cognitive tests at different times to replicate larger- scale studies carried out in Germany, Canada and America. The study has discovered about a 10 per cent improvement in pupil performance in the afternoon compared to the morning. An 11am school start was being considered (Gems Education, 2012).

The following articles present an insight into ways of managing a universal problem.

Sleepless in America: School start times, is an overview of the history of research into adolescents' delayed sleep-wake patterns and the growing movement of later school start times.

In Australia, recent research suggests that the school classroom may be a promising arena for the dissemination of sleep interventions for adolescents.

Sleep Scotland is raising awareness in schools of the importance of sleep. In England, *The Sleep Council's* teaching resource: '*Better Brains with More Sleep*' is being used to to teach pupils about the importance of a good night's sleep.

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Editorial
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Sleepless in America : School start times

In America, in the early 1990s, Mary Carskadon et al. (1993), showed that the circadian biology drives the delayed sleep-wake patterns of adolescents and "our current understanding of adolescent sleep patterns may need revision". Since then many American studies have examined the effects of sleep loss on young people and the effects of school start times.

Many school students in America start their lessons before 8 am. Some even begin at 7:00 am, leaving home around 6:30 am. A growing body of evidence has been used to challenge school start times suggesting that better student health, wellbeing and academic grades could be achieved with later start times.

In 2012, many campaigners continue to use the emerging research studies to support efforts to influence their local school boards and change the start of the school day.

For example, research compiled by Stacy Simera, (2011), is used to advocate for start times after 8:30 am for 6th through 12th grades students in Ohio.

Dennis Nolan's website (2012), contains an exhaustive compilation of research that is updated and used to influence later school start times in California as well as providing support for campaigners in other states.

Figures from the National Sleep Federation (2012), suggest that, "…individual schools or districts in 19 states have pushed back their start times, and more than 100 school districts in an additional 17 states are considering delaying their start times".

Adolescents' sleep

Carskadon et al., (1980) showed that adolescents require at least as much sleep as they did as children, generally 8.5 to 9.25 hours each night. Research also showed that many adolescents undergo a sleep phase delay that results in them both falling asleep and waking up later. Thus the typical adolescent's natural time to fall asleep may be 11 pm or later; because of this change in their internal clocks, teens may feel wide awake at bedtime, even when they are very tired (Wolfson & Carskadon, 1998). On a school day this leads to sleep deprivation due to waking up early for school, and not getting the 8.5 - 9.25 hours of sleep that they need. It also causes irregular sleep patterns affecting the quality of sleep, since the weekend sleep schedule often ends up being much different from the schoolday schedule as teenagers try to catch up on lost sleep (Dahl & Carskadon, 1995).

Carskadon et al., (1998), also found that more mature adolescents had later circadian rhythm timing, based on melatonin secretions in saliva samples. This showed that melatonin secretion occurred at a later time in adolescents as they mature; thus, it is difficult for them to go to sleep earlier at night. The melatonin secretion also turns off later in the morning, which makes it harder to wake up early.

School start times

In 1997, following the medical research that found that teenagers have biologically different sleep and wake patterns, the seven comprehensive high schools in the Minneapolis Public School District shifted the school start time from 7:15 a.m. to 8:40 a.m. In 2002, Kyla Wahlstrom published the results of a 4-year study that affected more than 12,000 secondary students. Among the many findings were: "Numerous 'beneficiaries' of a later high school start time emerge from the evidence in the study. The students benefited the most. For example, attendance rates for all students in grades 9, 10, and 11 improved in the years from 1995 to 2000, with the greatest rate of improvement for grade 9 students. Perhaps the most surprising finding was the discovery that Minneapolis high school students continue to get an hour's more sleep each school night than is the case for students whose schools begin an hour earlier. This is contrary to the fears and expectations that a later start would result in students staying awake an hour later on school nights. Instead, students in Minneapolis high schools get 5 more hours of sleep per week than do their peers in schools that start earlier in the

day."

"Similar studies on students have recently been completed in Brazil, Italy, and Israel …. Those studies have revealed that the sleep-wake cycle for students in those countries is nearly identical to that found among students in the United States. In other words, the sleep phase shift occurring in adolescents' neurological systems is not culturally based; it is, instead, a phenomenon of human development." (Wahlstrom, 2002).

A study in Kentucky, in 1998, focused on improved safety as a successful outcome of later school start times. A school district in Fayette County moved its start time from 7:30 am to 8:30 am, and students averaged up to 50 minutes more sleep per night. Comparisons in the car collision rates of Fayette County teenagers revealed that the car crash rate for 16-18 year olds dropped following the change (Danner et al. 2008).

Academic performance

Some of the studies that consider later school start times and academic performance include:

A study by Judith Owens et al. (2010), examined the impact of a 30-minute delay in school start time at a Rhode Island school on 210 adolescents' sleep, mood, and behavior. After the start time delay, mean school night sleep duration increased by 45 minutes, and average bedtime advanced by 18 minutes. The percentage of students getting less than 7 hours of sleep decreased by 79.4%, and those reporting at least 8 hours of sleep increased from 16.4% to 54.7%. Students reported significantly more satisfaction with sleep and experienced improved motivation. Daytime sleepiness, fatigue, and depressed mood were all reduced. Most health-related variables, including Health Center visits for fatigue-related complaints, and class attendance also improved. A modest delay in school start time was associated with significant improvements in measures of adolescent alertness, mood, and health. The results of this study support the potential benefits of adjusting school schedules to adolescents' sleep needs, circadian rhythm, and developmental stage.

Peter Hinrichs' research used data from 1993-2002 and looked at the impact of later school start times on academic performance using statewide standardized tests. The results did not suggest an effect of school starting times on achievement. (Hinrichs, 2011).

Eric Eidea and Mark Showaltera, (2012), explored the relationship between the amount of sleep adolescents receive and their performance on standardized tests and then estimate the "optimal" hours of sleep that maximize student test score performance. Results showed a statistically significant relationship between sleep and test scores using nationally representative data on students ages 10 through 19. Optimal sleep declines substantially by age: optimal sleep for 10-year-olds is about 9.0-9.5 hours, while for 18-year-olds it is slightly under 7 hours.

Finley Edwards used data from 1999-2006 to study the impact of start times on academic performance. Using variation in start times within and across schools he found that starting school one hour later leads to a three percentile point gain in both math and reading test scores. Using only variation in start times within schools over time, the effect is a two percentile point gain. Evidence was also shown for an association with later start times and decreased absences, less time spent watching television and a greater amount of time spent on homework. Edwards suggested that these factors may explain why later starting students have higher test scores. (Edwards, 2012).

Complex problems

Some of the complexities of changing school start times can arise due to the need to involve many people, including - parents, teachers, students, principals, school boards, and healthcare professionals. In addition, problems associated with re-organising transportation and extracurricular activities can be enough to delay or put-off attempts to bring about change. However, as the debates continue across America, the movement to alter school start times appears to be gaining momentum.

"*Even without the pressure of biological changes, if we combine an early school starting time - say 7:30 am, which, with a modest commute, makes 6:15 am a viable rising time--with our knowledge that optimal sleep need is 9 1/4 hours, we are asking that 16-year olds go to bed at 9 pm. Rare is a teenager that will keep such a schedule. School work, sports practices, clubs, volunteer work, and paid employment take precedence. When biological changes are factored in, the ability even to have merely 'adequate' sleep is lost.*" Mary Carskadon.

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Other useful websites

http://sleepforscience.org/about/

http://www.sleepfoundation.org/article/sleep-topics/school-start-time-and-sleep

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Neralie Cain

Ready, willing, and able? Sleep hygiene education, motivational interviewing and cognitive behaviour therapy for insomnia in an Australian high school setting.

Cognitive behaviour therapy for insomnia (CBT-i) is well-regarded as an effective treatment for insomnia in adults. Previous studies also suggest that CBT-i can be successfully applied to adolescents experiencing insomnia and other sleep problems, which most commonly involve delayed sleep timing (Bootzin & Stevens, 2005; Gradisar et al., 2011). The recommended treatment involves a combined program of morning bright light therapy, stimulus control therapy, and education about sleep hygiene (see Lack & Wright, 2007, for further details). Improving sleep pattern regularity by getting up earlier on weekends (i.e., at a time closer to the weekday wake-up time) can play a particularly important role in increasing total sleep time during the week and decreasing daytime sleepiness (Taylor, Wright, & Lack, 2008).

Recent research suggests that the school classroom may be a promising arena for the dissemination of sleep interventions for adolescents (for a review, see Blunden, Chapman, & Rigney, 2012). However, many of the earlier studies in this area have been plagued by problems such as inappropriate outcome measures, small sample size, lack of control group, and lack of follow-up data. Reporting has also been poor, with a number of studies presented only in abstract form. Results have been mixed: some studies showed improved knowledge about sleep, despite having no data about actual changes in sleep habits or behaviours (Azevedo et al., 2008; Cortesi et al., 2004); another study measured sleep habits but found no change from pre- to post-treatment (de Sousa et al., 2007). Finally, some studies found changes in sleep habits from pre- to post-treatment, although these results must be interpreted with caution due to the previously mentioned problems of small sample size, lack of control group, and lack of follow-up data (Rossi et al., 2002; Vo et al., 2003).

School-based intervention programs

A series of two studies conducted by researchers at Flinders University in Adelaide, Australia, attempted to overcome the limitations of previous research by conducting randomised controlled trials evaluating school-based intervention programs aimed at improving the sleep of adolescents (Cain, Gradisar, & Moseley, 2011; Moseley & Gradisar, 2009). Full details of these studies can be found in earlier publications; however, an outline of the main findings are presented here, along with recommendations for others planning school-based interventions for adolescent sleep problems.

Study 1 (Moseley & Gradisar, 2009)

Participants were 81 Year 11 students from two co-educational high schools, with 41 adolescents attending four sleep education classes (once per week for four weeks) and 40 adolescents participating as the control group (i.e., attending classes-as-usual). Sleep content was embedded in an "adolescent well-being" program in order to reduce demand effects, and was based on principles of CBT-i. This included sleep hygiene education, simple cognitive restructuring, goal-setting, relaxation strategies, and recommendations to reduce weekend sleep-ins.

Baseline data revealed that students had considerable sleep problems, with 53% of students getting insufficient sleep on school nights and 78% of students having a clinically significant discrepancy between their weekend and weekday out of bed times (suggesting that

a sleep education program was relevant to this group of adolescents). Students in the intervention group improved significantly in their sleep knowledge from baseline to post-program. When examining actual sleep habits, however, there were no significant improvements in any of the target sleep variables. Nonetheless, data from a subgroup of students who were classified as having a delayed sleep timing revealed a significant reduction in the discrepancy between weekday and weekend rise times (i.e., less sleeping-in on weekends).

Surprisingly, demand effects were limited as students honestly stated that they were not motivated to change their weekend and school-morning behaviour in order to get more sleep. This suggests that program content did not need to be disguised and non-sleep content could be replaced with more sleep information aimed at motivating adolescents to change their behaviour. It was also concluded that one lesson of cognitive therapy was inappropriate, as it introduced the students to their unhelpful thoughts and beliefs but did not provide enough time to fully work through them (due to time constraints in the program). Considering the findings that students improved in their knowledge about sleep but were not convinced about why they should get up earlier on weekends, it was concluded that principles of motivational interviewing (Miller & Rollnick, 2002) may be appropriate to help students improve their overall motivation to attempt and maintain changes in key sleep-related behaviours. Motivational interviewing is an effective, evidence-based approach to overcoming feelings of ambivalence that prevent many people from making desired changes in their lives, and has been successfully applied with adolescents (Miller & Rollnick, 2002).

Study 2 (Cain et al., 2011)

This study aimed to develop a revised sleep education program for Year 11 students based upon the conclusions of Moseley and Gradisar (2009) and feedback received from students and teachers. The primary aims of the revised program were: (1) to increase students' knowledge about sleep, (2) to improve students' motivation to get up earlier on weekends, and (3) to improve students' sleep-related behaviours and daytime functioning.

Participants were 104 Year 11 students from three co-educational high schools. Again approximately half of these students attended four 50-minute sleep education classes, held once per week for four weeks, and the remaining students attended classes-as-usual. The lessons were tailored to fit a motivational interviewing framework, although they also retained some aspects of the earlier CBT-i framework (e.g., sleep hygiene education, relaxation strategies, recommendations to reduce weekend sleep-ins and increase morning bright light exposure).

Baseline prevalence of sleep problems was again high, with 37.9% of the sample reporting difficulty initiating sleep, 59.2% reporting insufficient sleep on school nights, and 74.8% reporting a clinically significant discrepancy between their weekend and weekday out of bed times. Over the course of the program, students in the intervention group improved significantly in their sleep knowledge over time relative to the control group. Within the intervention group, students' motivation to get up about the same time every day also improved during the program, and there was a trend towards improved motivation to increase average total sleep time. In addition, students reported attempting to make changes to their sleep behaviour during the program. However, their increase in motivation and initial attempts at changing their sleep habits failed to translate into longer-term behavioural change.

Conclusions

The results of our research, along with recent research from other groups (Azevedo et al., 2008; Cortesi et al., 2004), suggest that school-based interventions are an effective method of increasing adolescents' knowledge about sleep. Furthermore, these interventions appear to improve students' motivation to change their sleep habits, despite difficulties in maintaining any attempted changes beyond the duration of the program.

Several key sleep-related behaviours were targeted in these school-based sleep intervention programs. We observed improvements in students' motivation to regularise their out-of-bed times and to increase their average total sleep time during the program. However, students were not

convinced that they should spend half an hour outside soon after waking up (to increase exposure to morning bright light). This finding is consistent with clinical observations that adolescents with delayed sleep timing have a tendency to avoid morning bright light, despite this being commonly recommended as a component of treatment (Gradisar et al., 2011). This suggests that improving motivation to use morning bright light may be a key to improving adolescent sleep habits. Future school-based sleep interventions could provide students with alternative ways of obtaining morning bright light, without necessitating exposure to sunlight (i.e., with the use of portable light devices; e.g., see www.re-timer.com).

According to Miller and Rollnick (2002), behavioural change requires the individual to be "ready, willing and able" (p.10). This means that the individual must consider the proposed change to be important (i.e., willing), must have confidence in their own ability to change (i.e., able), and feel that this is the right time for change to occur (i.e., ready). While our second study focused on improving adolescents' perception of the importance of change, future school-based sleep interventions should incorporate exercises designed to improve all three of these components of motivation to improve the likelihood that improvements in motivation will translate to longer-term behaviour change. For example, activities that may enhance students' confidence in their ability to change could include a review of past successes, brainstorming specifically how change could be achieved, and considering who else could support their attempt to change their behaviour (Miller & Rollnick, 2002). Interestingly, the inclusion of parent information sessions was also spontaneously suggested by two out of the three teachers involved in the program, when asked for their recommendations for future interventions. Recent research also suggests that parent-set bedtimes are associated with improved sleep and daytime functioning among adolescents (Short et al., 2011).

Recommendations for future research and practice

School-based interventions are effective in improving sleep knowledge among adolescents; however, an increase in sleep-related knowledge does not always translate into changes in behaviour that are maintained over time. While school-based interventions can improve students' motivation to change sleep-related behaviours, and students are happy to engage with homework-based behavioural experiments, future work in this area should focus on motivating students to maintain these changes over time. This could include providing students with artificial sources of morning bright light (Gradisar et al., 2011), offering sleep education sessions for parents and/or encouraging parental involvement in treatment (Short et al., 2011), and encouraging students to consider how to overcome potential obstacles before they arise.

Feedback from students and teachers suggests that school-based sleep intervention programs are generally found to be interesting and enjoyable (Blunden, 2007; Cain et al., 2011; Cortesi et al., 2004; Moseley & Gradisar, 2009). In particular, our research has found that interactive learning activities promote student engagement (Cain et al., 2011), so these should also be an important component of any future school-based sleep intervention.

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Jane Ansell

Sound Sleep: raising awareness in schools of the importance of sleep for our emotional and physical wellbeing

Sleep Scotland is a charity, established in 1998, providing support to families of children and young people with additional support needs and severe sleep problems. Sleep Scotland has worked throughout Scotland developing services and providing intensive sleep programmes for children by establishing sleep clinics and training sleep counsellors.

Sound Sleep

Based on experience gained from their work, Sleep Scotland launched a new project in 2010. *Sound Sleep* aims at raising awareness, in mainstream secondary schools, of the importance of sleep for students' emotional and physical wellbeing.

Jane Ansell, the director and founder of Sleep Scotland, said lack of sleep among UK teenagers was a "huge problem". "We began in 1998 working with children with special needs with sleep problems," she said. "In my teenage clinic I felt I'd got a lot of kids who maybe didn't have ADHD or Asperger's - they had total sleep deprivation."

Glasgow city council estimated that as many as one in four teenagers were not getting the appropriate nine hours of sleep at night, and said there was "increasing evidence" suggesting a link between lack of sleep and obesity, lower academic achievement and depression.

Pilot project

Using funding from *BBC Children in Need Scotland*, Sleep Scotland, put together an outline for a pilot project that specifically supported teenagers who have sleep problems.

Part of the project involved conducting school workshops with three secondary schools in Glasgow in an attempt to tackle problems caused by a lack of sleep. Surveys in the schools showed that after going to bed at 11 pm or midnight, teenagers were staying awake for hours watching television, playing on games consoles, or browsing the Internet. Some pupils were getting as little as four or five hours sleep a night.

Ms Ansell said, '"Sleep is when the brain rewires and consolidates the memory. If that is being deprived, not only do you have a kid who is too tired to concentrate, but also his brain won't work to full capacity." Ms Ansell also said that addressing the problem has been made harder by a wider social attitude towards getting by on small amounts of sleep, but insisted that ensuring children were getting sufficient sleep was as important as making sure they ate five pieces of fruit and vegetables a day and did regular exercise.

Workshops

The classes were offered as workshops for groups of 20 secondary school pupils, with an after-school session for parents and staff advising how to support teenagers to get good sleep.

One 15-year-old who attended the first of a series of sessions said he had tried going to bed early as a result of what he had been taught. "I went to bed at ten-ish rather than 11, and I do feel a little bit more awake," he said. "I wasn't sleeping in French, as I usually do, so my French teacher is pleased anyway."

Better sleep

The pilot project enabled students to understand the process of sleep, why it is so important for their well being and strategies that they could implement to promote a good night's sleep.

Some of the strategies Sleep Scotland

discussed with students were:

- Make sure you have a substantial main meal at a regular teatime
- Restrict homework, exercise and computer games to the early evening
- The hour before bedtime should be for relaxing and bathing, and should include no stimulating activities
- Switch off the computer, mobile and television before having a bath. Try listening to music, radio, or read a book
- Avoid chocolate, caffeine, additives, alcohol and nicotine before bedtime Have a warm milky drink instead
- Your bedroom should be quiet and dark; make sure it is a media-free zone
- Keep to a regular bedtime
- In order to have a good sleeping pattern it is important to be consistent. This also includes having a set waking time

Outcomes

One of the outcomes of the pilot project was the development of a teaching pack which was then offered to other schools. The pack was supported by training days for education professionals throughout the UK.

Teaching pack

The *Sound Sleep* teaching pack aims to raise awareness of the importance of sleep to young people in secondary schools across the UK and encourages them to make informed decisions. By providing young people with information about sleep and its importance, they will be enabled to understand how the choices they make will impact upon their ability to learn and their general health and wellbeing.

Young people will have an opportunity to learn about, discuss and implement strategies to develop a good sleep routine that will help them to achieve their full potential. Having sleep on their agenda helps young people to discuss it in peer, teacher and parental relationships. Information about different agencies also provides additional support.

The pack includes: User's guide: Background reading for teachers; Curriculum guidelines; Detailed lesson plans for different ages throughout secondary schools; Resources for lessons including PowerPoint presentations and handouts; Resources to address staff and parental awareness of sleep and its importance for wellbeing.

Training Days

The *Sound Sleep* training for trainers provides delegates with the skills and resources to deliver training to secondary school staff about sleep awareness and how to implement the *Sound Sleep* pack into schools.

The training includes: Sleep: An introduction to the physiology of sleep, adolescent sleep and sleep disorders; How to sleep well: Overview of sleep hygiene theory and putting it into practice; The Sound Sleep Pack: Aims & objectives; Becoming a Sleep Ambassador: Planning, implementing and monitoring sleep awareness in schools.

Developments

Jane Ansell said '*Sound Sleep* fits perfectly into our Curriculum for Excellence. We are delighted to work with education on this new project giving our future citizens sound sleep.'

Sound Sleep one day training events will be held in Perth on Friday 16th November 2012 and in Glasgow on Wednesday 13th February 2013. For more information visit Sleep Scotland's website at www.sleepscotland.org or contact Karen Jenkinson on 0131 651 1392.

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Lisa Artis

The Sleep Council's teaching resource: '*Better Brains with More Sleep*'

With numerous reports in the media that children and teenagers do not get enough sleep, The Sleep Council believes that sleep should be on every school's agenda and this article describes what it is doing to help 'sleep awareness'.

"Sleep is absolutely essential to health and well-being," says Jessica Alexander of The Sleep Council. "We have actively promoted the importance of sleep for children and teens over the years and have conducted research surveys on the subject."

"It is my belief that teaching children the value of good sleep should rank alongside the importance of healthy food and exercise in schools.

"The government's *Change 4 Life* programme is a great initiative but, unfortunately, it does not mention sleep, let alone teach it in school. Yes, diet and exercise are extremely important but so is sleep. Today's way of life is seeing more and more children and teenagers getting less and less sleep due to the popularity of smartphones and tablets and the rise of social networking." With no legal requirement to include anything about sleep on the school timetable, the word 'sleep' does not even appear in official national curriculum guidelines.

"It's not just us that think sleep should be taught," says Jessica. "Our *Pillow Time* survey in 2009 found that 73% of respondents thought children should be taught about the importance of a good night's sleep at school. Six out of 10 went as far as to say sleep education should be included in the national curriculum."

"Sleep is something that every single one of us does without giving too much thought to just how important a good bed is to a good night's sleep. And how important good sleep is to how well we cope with everyday life. Students, in particular, need to ensure they get a good night's sleep or they risk obesity, heart disease and mental illness. It is crucial for memory, learning and growth."

'Sleep awareness' education project

In March 2012, The Sleep Council launched its first-ever 'sleep awareness' education project in primary schools for its annual awareness event, National Bed Month.

A free learning resource was provided to schools nationally, with the aim of teaching primary school children the importance of a good night's sleep and factors - such as regular bedtimes and a good bed - that can affect it.

"There is a lack of understanding and education about the subject," says Jessica. "Daytime tiredness in young students is a real issue, so schools need to provide more formalised information about the benefits of sleep as part of ongoing compulsory health education."

"Some parents, for instance, don't know how many hours sleep their child needs. As a general rule of thumb under three's need 12 hours sleep a night; four to six year olds between 10.5 and 11.5 hours; six to 12 year olds around 10 hours and teenagers about eight to nine hours."

The 'sleep awareness' initiative followed the results of a survey '*Time to Learn*' of 250 primary school teachers conducted on behalf of The Sleep Council. The survey was carried out, between February 8 and February 14 2012, by Opinion Matters via an online survey/telephone survey. A total of 251 UK primary school teachers (teaching pupils aged between 4 and 11-years-old - reception to Year 6 classes) took part.

The survey revealed that lack of sleep among

primary school children was having a devastating effect in schools with nine out of 10 teachers (92%) complaining that pupils were so tired they were unable to pay attention in class. More than a third (38%) said lack of sleep among youngsters is a daily problem for them.

"As part of our 'sleep awareness' project we wanted to establish just how much of an issue lack of sleep has become among young schoolchildren," said Jessica. "Even we have been taken aback by the sheer scale of the problem."

'*Better Brains with More Sleep*'

The learning resource, '*Better Brains with More Sleep*', consists of four lesson plans with clearly identified learning outcomes suitable for eight to 11 year olds. Each lesson plan includes teacher's notes on how to structure the lesson and photocopiable activity sheets for pupils. As part of the activity, pupils will be asked to produce a 'sleep diary' which is designed to get them thinking about, and interested in their own sleep patterns, as well as their parents', and to help them understand that people have different routines.

Said Jessica, "The resource pack is designed to teach pupils about the importance of a good bed and a good night's sleep in a fun, informative and interactive way. Our survey would suggest this is information that needs reinforcing among primary school children."

"We are very lucky to have Fara Butt of Shire Beds on our marketing committee. Fara's teaching background has been extremely helpful in preparing what we think is a really good educative lesson plan."

Said Fara Butt: "Speaking as a teacher myself, I think the lesson plan is very good. Not only is it a fun and much needed tool to help educate children from an early age on sleep but also their parents! The fact that kids can take the lesson plan home and do it with their families makes it an enjoyable, interactive tool that is extremely relatable to everyday life."

According to the '*Time To Learn*' survey, lack of sleep has become such a widespread issue in primary schools that nearly a quarter (24%) of the teachers questioned admitted that they had had to resort to letting children who are very tired sleep in a corner of the classroom.

Nearly nine out of 10 teachers (88%) felt that too many distractions in the bedroom (games machines, TVs etc) were at the root of sleep related problems along with the fact parents are simply not strict enough about enforcing bedtimes (82%). And more than half (55%) agreed that the brightest children in the classroom are the best slept and most wide awake.

Said Jessica, "Lack of sleep would appear to be a problem across all primary school age groups which is a real concern. Our schools project will involve pupils monitoring the sleep habits of their parents which will hopefully also serve to remind them of the need to ensure their children get a decent night's sleep if they are to do well at school."

For more information or to request a '*Better Brains with More Sleep*' teaching resource please email lisa@sleepcouncil.com

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Mark D. Griffiths, Daniel L. King and Paul H. Delfabbro

Simulated gambling in video gaming: What are the implications for adolescents?

Recent empirical research studies suggests that children and adolescents access online gambling activities using digital devices such as personal computers, laptops, smartphones, and other portable devices (e.g., Griffiths & Parke, 2010; King, Delfabbro, & Griffiths, 2010). Three national adolescent gambling surveys carried out for the National Lottery Commission in Great Britain (Griffiths & Wood, 2007; Ipsos MORI, 2009; 2011) have all shown that a small minority of children and adolescents can and do gamble online. The most recent study (Ipsos MORI, 2011) reported that 2% of 11-16 year olds had played online lottery games and 2% had gambled on other online games (i.e., online casinos, online poker, online bingo and/or online sports betting). These data suggest that the first gambling experiences by some children and adolescents might occur via the Internet, mobile phones, and/or interactive television rather than in a traditional offline gaming venue such as a casino, amusement arcade or bookmakers (Griffiths, 2011).

Gambling simulation

As gambling on the Internet has expanded, a wide range of 'gambling-like' activities has emerged on smartphones, social networking sites, and within video games (Griffiths, King, & Delfabbro, 2009; Griffiths, 2010; King, Delfabbro, Derevensky & Griffiths, 2012). There are also opportunities to gamble without spending money on both commercial gambling websites and social networking sites. These 'free play' simulations of gambling activities provide opportunities for young people to practice or become more familiar with gambling activities without spending real money (Griffiths, King, & Delfabbro, 2009). Despite the proliferation of non-monetary gambling simulations, there has been little research or policy attention on them (Griffiths, 2010). Simulated gambling activities and gambling themes also feature in many modern video games. King, et al (2012) note that video games that feature gambling may be categorised according to the following three categories:

- ***Standard gambling simulation:*** A digitally simulated interactive gambling activity that is structurally identical to the standard format of an established gambling activity, such as blackjack or roulette. For instance, *Texas Hold 'em (TikGames)* is a standard gambling simulation of the poker variant of the same name. Poker is played using virtual credits against a computer opponent or in competition with other online players. Playing poker represents the entirety of the gaming experience in this video game. In contrast, the video game *Red Dead Redemption (Rockstar)* features a casino situated within the virtual game world that allows players to gamble using in-game credit with or against other players in social competitions. However, the gambling content within this type of video game represents only a small part of the overall gaming experience.
- ***Non-standard gambling simulation:*** An interactive gambling activity that involves the intentional wagering of in-game credits or other items on an uncertain outcome, in an activity that may be partially modelled on a standard gambling activity but which contains distinct player rules or other structural components that differ from established gambling games. For instance, the video game *Fable II Pub Games* contains three unique casino-style games, partly modelled on craps (dice), roulette, and slot machines. Players can wager 'gold coins' on

chance-determined outcomes (i.e., patterns in cards, dice throws, spinning wheels, etc.) in order to win greater amounts of gold, as well as other items and prizes.

- ***Gambling references:*** The appearance of non-interactive gambling material or gambling-related paraphernalia/materials within the context of the video game.

Online video games

Online video games may also feature opportunities to gamble. For example, online games such as *EVE Online* and *World of Warcraft* include player-operated gambling activities using the in-game currency. These activities are usually supported through websites adjunctive to the video game (i.e., wagers are placed outside the game), but the gambling activity (i.e., winning and losing) takes place in the game world. Gambling activities include sports betting (e.g., placing bets on the outcome of player duels and battles) and lotteries (e.g., selling raffle tickets for a chance at winning a prize). The relative scarcity of in-game assets, including currency and items, makes them valuable to the game's community of players. Some players will exchange real money for in-game currency as way of advancing more quickly in the game. The option to exchange in-game currency and other content (virtual goods) to other players for real world money thus gives these activities a limited, albeit indirect, financial element (Castronova, 2005).

Modern video games provide realistic and sophisticated simulated gambling opportunities to youth. According to our recent analysis (King, Delfabbro, and Griffiths, 2010), the potential risks of young people engaging in simulated gambling include:

- Greater familiarity with gambling and acceptance of gambling as a 'normal' entertainment activity;
- The development of gambling strategies and the ability to practice these strategies without need of money;
- The development of positive gambling beliefs and thoughts of 'winning big' associated with gambling;
- Exposure to the excitement of gambling wins, including bonuses and jackpots;
- False expectations about how gambling operates and an inflated sense of its long-term profitability.

Simulated gambling has the potential to offer positive experiences associated with gambling without the typical barriers to entry associated with gambling (e.g., money, age restriction). Although no actual money is involved in simulated gambling, it is recognised that people (including youths) are not only motivated to gamble for financial reasons. Gambling can provides excitement, relief from boredom, a way of coping with problems, and a means of social interaction (i.e., playing with friends). Very simply, gambling is engaged in not only for financial rewards, but for physiological, psychological, and/or social rewards (Griffiths, 1999). Simulated gambling activities may also enable young people to feel more comfortable with gambling *per se,* which may assist the transition from simulated gambling to gambling with real money.

A risk associated with video games that feature simulated gambling is that activities may often combine the skill and fast-paced action of a video game with the chance-based nature of gambling. This combination of skill and chance may set up false expectations about the governing rules and player control involved in gambling activities. For example, younger players may believe that, with sufficient practice, they can overcome and master the challenges of the game.

Serious social problem

Youth gambling represents a serious social problem (Volberg, Gupta, Griffiths, et al, 2010). Therefore, it is important for researchers, health professionals, and parents to be informed about emerging media risk factors for problem gambling. Commercial video gaming technologies provide young people with unrestricted access to realistic gambling and gambling-like experiences. This article has highlighted that some commercial video games feature casino-style gambling activities that enable players to gamble using in-game credit with or against other players in social competition. Simulated gambling via popular social networking applications such as *Zynga*

Poker, DoubleDown Casino, Slotmania - and, more recently, the proposed *Casinoville* which may feature real money - also raises significant concerns about the accessibility and ubiquity of gambling as a media pastime for young people.

Simulated gambling in video games is often associated with incentives and rewards, such as virtual currency, rare in-game items, and other content of large contextual value in the game. While some video games with simulated gambling (e.g., *Red Dead Redemption*) may be intended for use by adults only, many video games (e.g., *Pokémon*) feature content that appeals mainly to a younger audience. This material could therefore be considered a form of gambling advertising targeted at youth. Furthermore, simulated gambling in video games may enhance young players' familiarity of casino and card games. Given the brief overview presented here, we would recommend that policymakers should critically consider the growing presence of gambling in online gaming and social media technologies, and associated issues of social responsibility as these activities become more monetised and/or promote or otherwise endorse involvement in monetary gambling activities.

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Katja Joronen, Annukka Häkämies and Päivi Åstedt-Kurki

School-based drama, health and wellbeing: Challenges to studying its effectiveness

Previous qualitative studies demonstrate that using drama methods in education has several benefits perceived by students, including increased empathy, social skills and self-expression. However, effectiveness studies in the area of drama education are very rare. The current paper reports on the effect of a school-based drama programme on social and emotional wellbeing for 4th and 5th graders (mean age 10.4 years). In the study, the benefits of school-based drama in primary school students were examined by using a controlled before-after design (N = 190). The response rate was 71%. Assessments were obtained at baseline and right after implementation of the programme from students and teachers. Additionally students (N=16) were interviewed through semi-structured focus group interviews after the program in the drama classes. The findings suggest that the benefits of drama methods were connected to social and emotional wellbeing, such as improved social relationships in the class, decreased bullying and increased understanding of diversity of people, and consequences of bullying. This paper furthermore discusses the dilemma of studying effectiveness of drama methods in the school setting.

The project

Our project was inspired by previous positive results of qualitative drama research and the good experiences of teachers using drama in their class rooms (e.g. O'Toole & Burton 2005, Heikkinen 2010). Additionally, a systematic review (Joronen et al. 2008) showed that some school-based drama or theatre programmes succeeded in increasing knowledge and positive attitudes related to health behaviour among school children.

Another reason to develop a drama programme was the sad news of high level of bullying in OECD countries. Moreover, although Finnish students succeed very well in PISA studies they do not like school and their peer relations are at the lowest in OECD countries (OECD, 2009). We were assuming that drama as a collective and participatory method will improve social skills and social and emotional learning as well as social relationships between students and student and teachers. Our understanding of health is comprehensive and covers all areas of health - not only the physical aspects (see Keogh et al. 2012).

The school-based drama programme

The school-based drama programme had a strong focus on improving social competence and social and emotional wellbeing in the classroom which may also reduce bullying. We highlight that the drama process opens up understanding and alternative ways of acting in the reality of human relations at the individual as well as community level (Somers 2003, Häkämies 2007). Drama also involves mutual and democratic relationships between students, the teacher or other adult in school.

The drama stories used were related to friendship, loss of a friend, bullying, support to

the bullied classmate, tolerance and child abuse (Owens & Barber, 1998; Owens et al., Airaksinen, & Korhonen, 2002). The teachers implemented the drama sessions based on two drama handbooks. Home activities included interactional tasks between parent(s) and child (e.g. the child interviewed his or her parent about the school life and bullying when the parent was a school child). Parents' evenings were based on themes which emerged from parents' and teachers' suggestions, such as bullying, family-school cooperation and parental monitoring. Parents' evenings were led by a drama teacher, Annukka Häkämies, who used drama methods to enhance interaction between parents and teachers.

The research

The quantitative part of the study was a controlled before-after intervention design and the data were collected by structured questionnaires. Students (N = 190) and their parents (N = 190) were recruited from two primary schools with similar demographics and socio-economics in the Southern Finland and purposively allocated either to an intervention group (drama) or a control group. The response rate was 71 percent.

Data were additionally gathered through open-ended responses of students (n = 80) and semi-structured focus group interviews of pupils after the program in the drama classes. The main interview questions were: (1) What kinds of issues do you recall from the drama program? (2) Did you learn something in the drama program? (3) If yes, what kinds of things did you learn? Four focus group interviews were performed with four pupils (two girls and two boys) per group per class. (Joronen et al. 2011) The research data were analyzed statistically and by using inductive content analysis.

Assessments and qualitative results

Assessments included social competence, social relationships in the class room and bullying experiences. Multisource Assessment of Social Competence scale (MASK) (Junttila et al. 2006) is a 15-item scale and it measured social skills and antisocial behavior of pupils perceived by pupils and teachers. Two parts of School Wellbeing Profile (Konu & Lintonen, 2006) measured social relationships and bullying experiences at school.

There was a clear increase in empathy in the drama group assessed by teachers, $p<0.05$ (Figure 1 below). The antisocial behavior stayed at the low level in the drama group whereas it increased in the control group in teachers' assessments (Kemppainen et al. 2010). However, children's self-assessments of their social competence did not change significantly during the research period either in the drama or in the control group.

Figure 1. Pupils' empathy skills before and after drama programme in drama and control classes assessed by teachers (Md) (1 = never, 4 = very often)

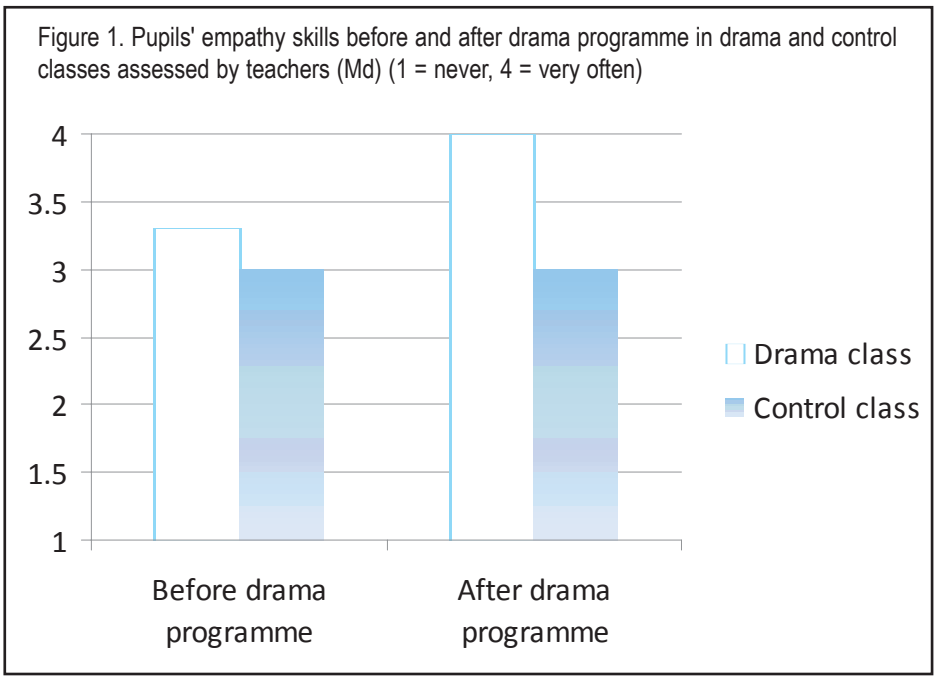
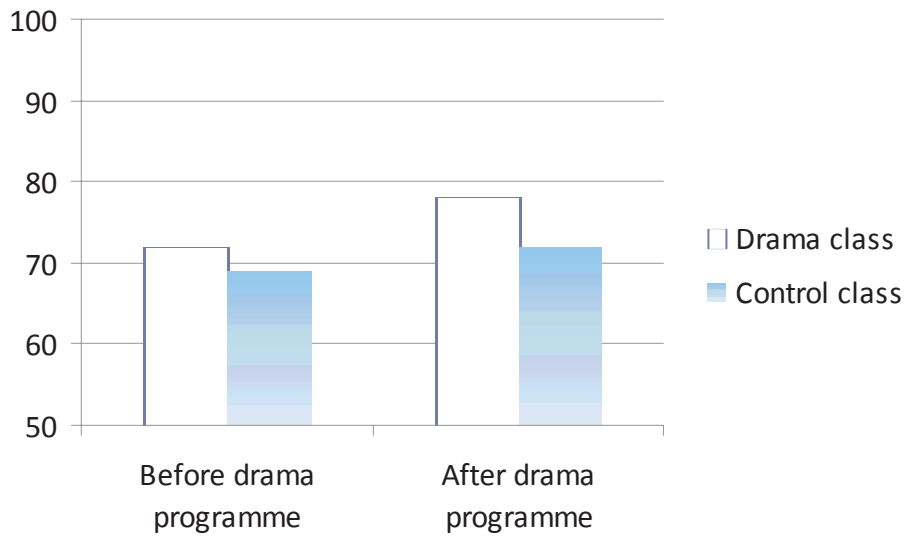


Figure 2. Student-student relationships before and after drama programme in drama and control classes (Mean) (0 = very poor, 100 = very good)



A statistically significant increase was found in student-student relationships assessed by pupils in the drama classes (Figure 2 above). Bullying victimization decreased from pretest (59%) to posttest (38%) in the intervention group ($p < 0.05$) whereas it stayed stable in the control group (38 - 39%). (Joronen et al. 2012).

The qualitative data showed that some students had negative experiences about the drama: doubt about the authenticity of the stories, the open end of the stories irritated a few of the students, some of the students found the drama sessions boring without analyzing this in more detail, and getting an insight into the role person was perceived as difficult by a couple of students. The positive drama experiences of pupils included e.g. increased listening to others and conversations between child and adults, and processing emotions (joy, sadness, irritation). Pupils expressed that they learned through drama e.g. the significance and universality of friendship, consequences of maltreatment, friendly behavior and positive interaction with adults (Joronen et al. 2011).

Conclusion

The results showed that empathy skills of the pupils were improved and anti-social behavior stayed at the low level in the drama group. Additionally the student-student relationships in the drama group improved and bullying victimization decreased significantly from pre-test to post-test in the drama group. Qualitative data showed examples of enhanced social and emotional learning, such as processing emotions. The results suggest that drama has the potential of learning social and emotional skills at school. At the same time we should keep in mind that drama is only one pedagogical method and it may not be suitable method for every pupil in the classroom.

However, although our study controlled a number of intervening factors there is always a doubt of reporting too positive results. Students and teachers involved in any intervention may assess the impact in a socially desirable way. In future effectiveness studies should include the assessments from teachers, other school staff's, students and parents (see e.g. White et al. 2004). Heikkinen suggests new ways of research methods when studying drama in education; he speaks e.g. about narrative research. He also argues that research should take place throughout the process, not just at the end of the drama programme. (Heikkinen 2010) The long term effects of programmes also should be studied in future studies.

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Water supplementation improves visual attention and fine motor skills in schoolchildren

This paper addresses a gap in the literature on the effects of water supplementation on visual attention and motor performance in schoolchildren. There has been extensive research showing that dehydration in adults is associated with detrimental effects on cognitive performance. Furthermore, studies of schoolchildren found that those that arrived at school with a hydration deficit performed worse in cognitive tasks than those children who were better hydrated (see Edmonds, 2012, for review). This is a concern because a recent study of 452 UK schoolchildren, aged between 9 and 11 years old, suggested that 60% of children arrive at school insufficiently hydrated (Barker et al, 2012). These results are consistent with similar studies from France and Israel in which two thirds of the children, of the same age, were insufficiently hydrated at the beginning of the school day (Bonnet et al, 2012; Edmonds, 2012).

Drinking water at school

Once children have arrived at school the evidence suggests that they are not drinking sufficient water throughout the day to counteract the risk of dehydration or even to maintain the hydration level that they had when they arrived at school. Kaushik et al. (2007) recruited 298 participants from Years 2 and 5 from six UK schools. The total volume of fluid drunk by each child per day was recorded and results suggested that 71% of children did not drink the minimum fluid required in a school day to maintain their hydration level. This evidence is consistent with the results from a survey of fluid intake of 1,456 adults and children living throughout the UK (Gandy, 2012). All beverages consumed over a period of 7 days were recorded and the results showed that 56% of children between the ages of 7 and 10 years old were not consuming the European adequate intake.

Adequate Intake (AI) is the observed amount of fluid consumed by different population groups who have a healthy hydration status. The observed mean amount of fluid consumption is then recommended for each population group. The European Food Safety Authority (EFSA) recommends that boys between the age of 9 and 13 drink 2,100mL per day and girls of the same age drink 1,900 mL per day (EFSA, 2010). This recommendation is only a guide because the requirement for fluid intake will vary depending on the amount of fluid consumed within food, the ambient temperature, amount of physical activity, weight and body fat.

The amount of fluid that people consume is not just driven by physiological processes such as thirst but also learned behaviour and social customs. In 2000, a '*Water is Cool*' campaign was launched by ERIC (Education and Resources for Improving Childhood Continence) to encourage schoolchildren to consider that water can be a 'cool' social custom. A number of activities were introduced, including educating schools, parents and teachers about the importance of drinking water and lobbying local government. However, the evidence from Kaushik et al (2007) suggests that it is still not 'cool' to drink water in school. Furthermore, the current Education (Nutritional Standards and Requirements for School Food) (England) Regulations (2007) require only that schools have to provide a supply of drinking water on school premises without specifying where and how often children should have access. Thus, even if drinking water were "cool", it can be difficult for children to consume water during the school day.

Children drink more if they keep water on their desk

Evidence does show that children who have free access to water, on their desk, drink more water than children who have limited access, with water in the classroom but not on desks, or restricted access, with water outside of the classroom (Kaushik et al, 2007). Of the children in schools with free access, 46.5% drank less than the minimum recommended amount compared to 80 and 81% in the other two conditions. Research from Johnston Molloy et al. (2008), in which teachers were interviewed about their attitudes and knowledge of hydration, suggested that teachers were not keen to allow children to have water on their desks at school. Teachers thought that water on the desk may cause disruption in the classroom and an increase in toilet trips. However, although those teachers who did allow water on the desk did initially notice an increase in trips to the toilet this increase did subside quickly. Additionally, teachers did suggest that if they could be convinced that drinking water had a positive effect on classroom performance they would be more likely to consider allowing children to have easier access to drinking water. Recent studies have begun to investigate the question of whether water supplementation improves school performance.

Children perform better when supplemented with water

Results from a number of studies show that children performed significantly better on some cognitive tasks on the occasion on which they have been supplemented with water during the school day, than on occasions on which they had not. Edmonds & Jeffes (2009), Edmonds (2012), found that when children were given additional water their visual attention was significantly better than when they were not given any supplementary water. Visual attention is an important component of learning at school as children require this skill when concentrating on visual stimuli for example when reading and performing written mathematical operations. However, results from Edmonds & Jeffes (2009) showed that water supplementation did not improve the children's performance in fine motor tasks. This is not consistent with evidence from adult dehydration studies which have found that fine motor performance deteriorates in dehydrated adults (see Edmonds, 2012, for review). Fine motor skills are very important at school as research shows that in the course of a school day between 30% and 60% of time is spent using fine motor skills on activities such as handwriting (McHale and Cermak ,1992). Many classroom activities utilise both motor skills and visual attention such as copying text, and in tasks requiring hand eye coordination. Furthermore, there is a correlation between performance in tasks that require motor skills and visual attention, such as throwing and catching, and academic performance (Morales et al., 2011).

As children are in a learning environment for over 6 hours a day, 5 days a week it is important that their cognitive performance is at an optimum level. Therefore, the aim of this study was to determine if consuming water would improve tasks that utilise both fine and gross motor skills, and visual attention. The motor tracking task used in Edmonds & Jeffes (2009) required that the participant followed a track, which is a steady, unmoving target. In the present study a wider range of motor tasks were used.

The Study

A sample of 15 children (8 girls) between the ages of 8 and 9 years old, attending the same primary school were recruited. The children completed a number of tasks, in small groups of 2 to 4, on two occasions at least a week apart. On one occasion the children were supplemented with 250ml bottle of water, from which they could drink as little or as much as they wished and the amount of water consumed was recorded, and on the other occasion the children were not given a bottle of water. On the occasion on which they were not supplemented with a bottle of water, no child asked for a drink. The children were tested 20 minutes after they had begun to drink the water. The conditions were counter-balanced.

Measures

The children completed Visual Analogue Scales to represent levels of thirst and happiness. The two scales each consisted of a line with cartoons at either end depicting the extremes of the scale. The mood ratings were

calculated by measuring from the beginning of the line to the position at which they marked it; a higher score indicated higher levels of thirst and happiness.

The tasks selected that utilise both visual attention and fine motor skills were a letter cancellation task, a '*Ravin Rabbids*' Wii game and ball catching. The letter cancellation task is a paper and pencil task in which the children have to find and cross through a target letter within a grid of distractor letters. The children were given 1 minute to cross through as many targets as possible. Children's scores on this task were calculated by subtracting any errors from the number of correctly identified targets. A higher score indicated better performance.

The '*Ravin Rabbids*' is essentially a "*whack a mole*" game that is performed on the Wii games console. The participants all stood to carry out this task. The children viewed a car full of screaming rabbits. At irregular intervals a rabbit would stand up and the participant was required to bang it on the head by pressing the button and using a downward motion with the Wii handset. The rabbit would then sit back down. The game was played for two minutes and the score was a combination of the number of rabbits hit and the speed in which this was achieved; a higher score indicated better performance.

The ball catching task required the child to catch a ball thrown underarm to them from 2 metres away. If children dropped the ball, they were instructed to pick it up and continue as quickly as possible. The score was the number of times they caught the ball in 2 minutes.

The last task administered predominantly uses gross motor skills. This task, step ups, required the children to step up and down quickly on the bottom step of a set of stairs. The score was the number of step ups completed in a 2 minute period.

Results

In the water supplementation condition, all children consumed some water, drinking an average of 168 ml water (SD = 95ml). The range was from 30 ml to 250 ml and 7 children drank the maximum 250ml water offered. In the no water condition none of the children had a drink.

The scores for all of the tasks were analysed using a t-test to compare the scores that the children self reported and obtained when they were supplemented with a bottle of water with the scores on the occasion on which they were not given any water. The means and standard deviations for each task in each condition along with the results of the statistical analysis are shown in Table 1. Measures that had significantly different results between the water supplementation and no water conditions are shaded.

Table 1: Means and standard deviations, in brackets, for scores in a water supplementation condition and a no water condition

Outcome measures	No water condition	Water supplemented condition	Paired t-tests
	Mean	Mean	
Thirst Scale	.70 (.16)	.31 (.13)	p<.001
Happiness Scale	.67 (.12)	.70 (.14)	ns
Letter Cancellation	128.9 (5.8)	136.4 (5.1)	p<.001
Raving Rabbids	13315.9 (3477.2)	14962.1 (3670.0)	p = .047
Ball Catching	45.6 (6.2)	46.9 (6.0)	ns
Step Ups	110.7 (8.7)	113.0 (9.4)	ns

The children rated themselves as significantly less thirsty on the occasion that they were supplemented with water than on the occasion when they were not. However, levels of self-reported happiness were not sensitive to water supplementation and results were similar on both occasions. In the letter cancellation task and '*Ravin Rabbids*' game the children had significantly higher scores on the occasion when they were supplemented with water compared to the occasion when they were not. However, the ball catching and step up tasks showed no significant effect of water supplementation.

Exploratory analyses were then carried out to assess if the level of thirst or the amount of water drunk correlated with task performance. There was no significant relationship between levels of thirst and task performance, but the

amount of water consumed did correlate with performance on some tasks. In the '*Ravin Rabbids*' task a moderate positive association was found between performance and amount drunk r=.66, p=.008. Additionally, a moderate positive association was found between performance and amount drunk in the ball catching task, r=.69, p=.004. These results initially suggest that this is a dose response effect so that as amount of water consumed gradually increases so do the results for task performance. However, a close look at the data showed that participants either drank less than 100ml of water and achieved lower scores or more than 200ml of water and achieved higher scores.

Discussion

Our results show that performance on tasks requiring both visual attention and fine motor skills were improved by consuming water. When the children were supplemented with water, their scores for the Ravin Rabbids game were higher than when they were not given extra water. The children also performed better in the letter cancellation task when supplemented with water. These results are consistent with Edmonds & Jeffes, (2009), who found a large effect size when investigating the effects of fluid consumption on visual attention and a similarly large effect size was found in this study, with a Cohen's d value of .99.

Furthermore, consuming more than 200ml of water resulted in improved ball catching skills, compared to those who drank less than 200 ml, although this finding must be interpreted with caution. As the participants either drank below 100ml or above 200ml it is not possible to determine how drinking between 100ml to 200ml may have affected task performance. Therefore, it cannot be established whether performance improvement was a bimodal effect of drinking over a specific threshold of water or if the result was a dose response effect of water which could not be clearly observed.

Performance on the step-ups task did not improve in the water supplementation group. This may be because the step-ups task requires the use of larger muscle groups, rather than fine muscle skills and visual attention, which may not be affected by supplementation. However, this finding is not consistent with evidence from the sports literature in which water supplementation has been found to improve physical performance (Edmonds, 2012). Indeed, both stamina and strength have been found to be improved by water consumption in adults. One explanation for this inconsistency with the adult literature might be that the duration of our step ups task was very short, only 2 minutes, and, therefore, resources of stamina or strength were not required to complete the task.

The results from these analyses support the argument that children's performance in tasks that require fine motor skills and visual attention are improved by water supplementation. However, it is not possible to elucidate from this study whether both fine motor skills and visual attention are sensitive to water consumption or whether just one of these skills is improved. Further investigation is already underway to assess these skills separately and in more detail.

Future studies are already taking place in which participants' hydration levels, using biomarkers such as urine osmolality, diet and exercise are recorded before testing. In the current study this information was not collected and so it is not possible to ascertain whether the individual childrens' hydration statuses were similar at baseline and if diet and exercise may have an impact on both the children's hydration status and task performance.

Conclusion

The results from this study suggests that having a drink of water improves children's visual attention and fine motor skills. Thus, it is likely that the positive effects of water supplementation would extend to classroom based activities such as handwriting and copying text. These results add to the growing body of evidence that supports the argument that drinking additional water positively affects children's cognitive performance. This has implications for the availability of water in schools and would suggest that water should be made available in the classroom so that children have regular and easy access to drinking water. Providing easy access to drinking water may be a cheap and simple method of improving performance in the classroom.

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Musical games and empathy

Empathy - the understanding of, sensitivity towards and ability to adequately respond to another's feelings - is a vital human capacity. It is important for enabling healthy and meaningful relationships; it is important for maintaining functional and productive communities; and it may even be important for resolving conflict and promoting co-existence between clashing societies. Advancing and enhancing a capacity for empathy already in childhood must thus be a major goal in education. But how can we 'teach' children to be empathic? One way could be to explicitly talk with children about empathy. Define what it is, demonstrate it through case studies, and even practice it through role-playing. I would like to present here a complementary, bottom-up approach, based on implicitly strengthening in the child some of the cognitive and social foundations necessary for empathy. I would like to describe how this could be achieved through recurring sessions of musical group interaction (MGI) - the joint playing of music by a group of individuals, in this case, children.

Musical group interaction and empathy

Careful analysis of how MGI participants may interact musically, socially and emotionally, revealed that many MGI features and many of the skills required and acquired by MGI participants may also be necessary for empathic behaviour (Cross, Laurence and Rabinowitch, 2012). For example, players in MGI need to be very attentive to each other's rhythms and to continuously adjust their playing in order to keep in synchrony. Such attention, understanding and adjustment appear to be essential for empathy. So it might be the case that as MGI participants become more and more proficient in maintaining synchrony and in mutually adapting to each others' musical productions, they may more readily exhibit empathy towards others just because it is easier and more natural for them to attend to what is transpiring in others. Similarly, when engaging in music, players are virtually compelled to imitate each other physically, as well as 'musically'. For example, musicians naturally echo each other's musical phrases, and it is well documented that they often imitate also each other's bodily gestures (Juslin and Västfjäll, 2008; Overy and Molnar-Szakacs, 2009). Thus, imitation may align players, making each other's intentions and emotions more accessible. Moreover, imitation in general is considrered to promote the sharing of mental states and help us understand and experience empathy (Meltzoff and Decety, 2003; Frith and Frith, 2006). Regular participation in MGI may thus develop the practice of such imitation, which might generalise to an every day tendency to observe and absorb others' state of mind resulting in an improved accessibility to their emotional needs. Another example stems from the potential of MGI to form an environment of affiliation and trust. Unlike language-based interaction, musical interaction does not require the interacting participants to be explicit about their opinions or their interpretation of the collective experience (Cross, 2005). Instead, musical interaction permits a considerable degree of flexibility and ambiguity without compromising the integrity of the joint outcome. During the interaction, each participant can sense that they are experiencing the meaning of the music 'naturally', and the experiences of other participants are perceived as being in alignment with their own. This may

establish a sense of openness, affiliation and trust amongst players. Thus, regular participation in MGI may teach children that it is possible to reach and understand other children, even if they initially seem to be very different from them. Moreover, children who become accustomed to situations of openness and affiliation are likely to become more open to cooperating and understanding others in general. Similarly to synchronisation, imitation and to the overall sense of affiliation and trust, we identified a set of additional MGI features that may also be conducive to empathy (Cross, Laurence and Rabinowitch, 2012).

The MGI programme

In order to explore whether indeed the skills and attitudes foregrounded during MGI might generalise to everyday, non-musical interactions and facilitate empathy in these interactions, we designed a special MGI programme for school children, consisting of musical games and tasks, each intended to emphasise a certain potentially empathy-promoting MGI component. For example, synchrony games were designed to encourage the interacting individuals participating in the joint musical interaction to gradually experience synchronisation. One such game was the 'Improvising Rhythm' game in which the group's task is to improvise together, while the rhythm is being constantly changed, either spontaneously, by one of the group members, or by someone from outside the group. Importantly, the games were designed to ensure that the musical encounters should be other-directed, rather than directed towards self. It should also be noted that the games did not require children to be aware of any explicit process of empathising; they were intended to focus children's attention on the process of engaging musically with each other within the constraints of each game. In order to appreciate the effects on empathy of the MGI programme we developed a set of measures intended to evaluate the children's capacity for empathy before and after participating in the programme.

Testing the MGI programme

A one-year long study run in four UK primary schools in one-hour weekly sessions produced very encouraging results (Rabinowitch, Cross and Burnard, 2012). The 8-11 year old children who participated in the MGI programme displayed increasing sophistication and cooperation in their musical interactions throughout the year (Figure 1). Remarkably, their capacity for empathy improved substantially by the end of the study and was significantly higher than that of children participating in a parallel non-musical interaction programme, as well as children not partaking in any additional programme as part of the study.

Figure 1: Children playing together in an MGI session (faces masked for privacy reasons).

Musical games

Following are a few representative examples of games introduced during the MGI sessions, grouped according to a subset of particular MGI components expected to contribute to empathy (Table 1 opposite). In addition to several new games invented especially for the study, many of the games were taken from or inspired by the wonderful book by the late Tony Wigram, 'Improvisation; Methods and techniques for music therapy clinicians, educators and students' (Wigram, 2004). Further details are readily available upon request.

Emphases and general guidelines

Beyond the prescribed MGI programme of games and interactive sessions, are several overarching principles for running a successful MGI programme, many of which became apparent while running the programme.

General atmosphere. Most pertinent to the conducting of MGI sessions is the constant maintenance of an atmosphere of sharing and

Table 1: Examples of musical games according to several of the MGI features expected to contribute also to empathy. Each feature is followed by a brief description (grey shading) and then by a short list of a few representative games.

Synchrony: Players are encouraged to be aware of a common beat and align themselves with it.	
Dyadic rhythm	Each pair of children face each other while several especially rhythmic musical excerpts are played. In each pair one child is the leader and the other is the follower. The task of the leader is to create bodily rhythms that 'match' or represent the rhythms which are being played, and the follower's task is to try as much as possible to follow the bodily movements of the leader.
Composing rhythm	The group composes together a rhythm (beginning with short segments and gradually shifting to longer ones).
Imitation: Players are encouraged to imitate each other during the musical interaction.	
Mirror, imitate, match	Children are seated in a circle, and each time one of them plays a short phrase, the child next in line either imitates or matches the phrase of the previous child, creating a long line of short connected melodies.
The 'echo' game Wigram (2004), p.187	Each child picks an instrument they like; one child plays a sound or a short phrase on the instrument. He is the leader now. All others have to echo the sounds he is making, but together, at the same time.
Ambiguity: Musical interaction leaves explicit interpretations and meanings ambiguous.	
Send a message Wigram (2004), p.185	Each group member sends a message to one of the other members, which is then sent on to the next member.
Transcription	The group writes a very short verbal conversation (a few short sentences) and then tries to 'transcribe' it into music.
Shared intentionality: Participants in musical interaction share unifying goals and intentions.	
Soft-loud-soft Wigram (2004), pp.189-90	Everyone starts playing very softly, then gradually very loud, and then soft again, in a spontaneous sequence.
Musical puzzle	Each child is given a musical piece of a puzzle (either as a form of a CD, as a simple notation, etc.) and together as a group they are asked to try and reconstruct the whole piece.
Intersubjectivity: Participants in musical interaction share affective and cognitive dynamics.	
Themeing another	Each child chooses another child to think about when they are playing. It could be done in duos or trios (smaller groups) thinking about one another, or with the bigger group as a whole.
Musical mindreading	Children need to reveal what is the theme that another child has in mind, or what is the 'mood' of the other child, only through the musical playing.

togetherness, devoid as much as possible of competitiveness. This must be done, however, without compromising the importance of each single participant as an equal and significant contributor to the interaction. It is a fine balance, which can easily be disrupted, especially in a musical context, and must thus be persistently monitored and regulated. Especially helpful was to position the children, when relevant, in a circle (implicitly emphasising union, balance,

equality), assigning each child to a particular musical instrument (signifying individuality), and obviously making sure that the children receive a similar share of leader/follower roles in the tasks being performed.

I also found it important to frequently pair children who initially seemed reluctant to cooperate one with the other, such as boys and girls, or children who were not speaking to each other. It always worked. And I believe that this had substantial value in distilling within these children new possibilities for communication, significantly substantiated by the use of music.

Musical background

Participants in the study had diverse musical backgrounds. Not surprisingly, I found that the stronger the musical background the deeper and more far reaching were the MGI encounters. This was reflected in the level and sophistication of the interaction, the degree of immersion of the children in the interaction and utterly their enjoyment and satisfaction. The MGI programme is thus not proposed as an alternative to regular musical training. On the contrary, it has a lot to benefit from existing musical proficiency of participants. It can be viewed it as an intermediate between musical education and social enrichment activities.

Process rather than goal

A further important approach sustained throughout the MGI sessions, was to emphasise repeatedly that there was no goal to accomplish in the interactions except for playing together and enjoying the interaction. This was in line with the perspective taken by such researchers as Small (1998) and Finnegan (2007), whereby music is to be seen as an activity rather than an objective, and that the making of music, is much more relevant and important than the final outcome. I found it helpful to assume a hands-off attitude, providing children with maximum creative freedom within the boundaries of the task being performed. In this way the centre of attention shifted from the task goals to what is actually being done during task performance and to doing it in a most interesting and joyful way.

Discussions and verbalisation

Typically, intervention programmes consist of recurring open discussions and reflections about group dynamics and personal processes taking place. I chose not to initiate any verbal discussion about what was happening during the MGI sessions, and the children never appeared to require any such discussion. The MGI experience just sank in and it seemed that any articulation would only spoil the experience. This was a remarkable manifestation of the kind of communication that music offers: heavily charged with emotional content but free of explicit specification.

Conclusion

Developing and encouraging a capacity for empathy in children is a challenge for modern society, which can be comprehensively addressed by educational systems as well as parents. Taking advantage of the inherent characteristics of musical group interaction, a most ancient form of human social activity facilitating social-emotional communication, we have designed a special programme consisting of multiple musical games introduced to children according to particular guidelines and principles. The MGI programme was capable of enhancing the capacity for empathy of participating children, presumably by developing and strengthening particular cognitive and social skills in these children that are required for empathic behaviour.

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