

# Application of a web-based cognitive-behavioural therapy programme for the treatment of selective mutism in Singapore: a case series study

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**INTRODUCTION** Selective mutism (SM) is characterised by limited or a lack of speech in selected social settings. Recent reviews suggest that cognitive-behavioural therapy (CBT) is an effective and promising treatment approach for SM. However, there is still a lack of studies documenting the applicability of CBT for SM in diverse populations. The goal of the present study was to examine the use of a web-based CBT programme ('Meeky Mouse') among Singaporean children diagnosed with SM.

**METHODS** Five children with SM (one boy and four girls aged 6–11 years) participated in the 14-week 'Meeky Mouse' programme, in addition to being prescribed with an unchanged dosage of fluoxetine 10–20 mg daily. The progress made by the children throughout the course of the programme was documented by the therapist.

**RESULTS** Post treatment, four out of the five children demonstrated improvements in the frequency of speech during therapy sessions at home, in school and at other social situations.

**CONCLUSION** Findings from the present study provide support for the use of a web-based CBT programme in improving speech and decreasing the severity of SM among affected children.

*Keywords: anxiety, cognitive-behavioural therapy, selective mutism, web-based*  
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## INTRODUCTION

Selective mutism (SM) was first described in 1877 by Adolf Kussmaul, a German Physician, who named it 'aphasia voluntaria', which meant children withheld speech voluntarily in some settings. In 1934, the term was changed to 'elective mutism' (elektiver Mutismus bei Kindern) by Moritz Tramer, a Swiss child psychiatrist, which implied that these children choose or elect to speak, giving the impression that they have the control to refuse speaking when they choose not to speak. As such, SM was once viewed as a result of oppositional and manipulative behaviours. In the more recent Diagnostic and Statistical Manual of Mental Illness - Fourth Edition (DSM-IV)<sup>(1)</sup>, the term was changed to 'selective mutism' to indicate the presence of anxiety, which caused these children to withhold speech in selected settings (i.e. school, social gatherings), suggesting that these children were selectively mute as a result of being scared or anxious, instead of being defiant or oppositional.<sup>(2)</sup> Since then, SM has evolved in its definition and is now defined by the current DSM-IV-TR as limited or a lack of speech in selected social settings.<sup>(3)</sup>

Studies have highlighted a gradual increase in the prevalence of SM since the early 1990s.<sup>(4,5)</sup> Recent evidence suggests that the prevalence of SM is about 2% of the population, and that there are at least one or two children with SM found in primary schools.<sup>(6,7)</sup> Most children often show symptoms of SM before

entering school, and these symptoms become more prominent during the school-going age when there is an increased pressure to speak.<sup>(8)</sup> The gradual increase in the diagnosis of SM was also reflected in the Singapore context. Based on data from the Child Guidance Clinic, an outpatient child psychiatry clinic in Singapore, the percentage of patients with SM seen in 2007 had increased from 1% to 1.4% in 2010.

A growing body of evidence suggests that SM and anxiety disorders are closely related. SM is seen as a persistent childhood disorder that results in high levels of anxiety, and is also seen as the most extreme form of childhood social phobia.<sup>(9–11)</sup> Black and Uhde<sup>(10)</sup> examined 30 children (9 male and 21 female, aged 5–12 years) diagnosed with SM and found that the majority (97%) met the DSM-III criteria for social phobia and/or avoidant disorder. In another study, Kristensen<sup>(11)</sup> found that 70% of the children in the SM group also met the DSM-IV criteria for an anxiety disorder, re-emphasising SM's classification of being an anxiety-related disorder.

Although there is no 'gold standard' of treatment for SM, treating anxiety in order to improve speech appears to be an aetiologically sound option.<sup>(12,13)</sup> Several studies have indicated that the use of 'fluoxetine', an antidepressant, was successful in reducing anxiety levels in children with persistent SM and comorbid anxiety disorders.<sup>(14,15)</sup> Therefore, although pharmacotherapy is not recommended as the first choice of treatment, it

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is suggested that including medication in the treatment scheme, as part of a holistic intervention, is helpful.<sup>(16)</sup>

Studies have also indicated that cognitive-behavioural therapy (CBT) is effective in reducing anxiety symptoms among anxious children, with favourable long-term outcomes.<sup>(17-19)</sup> Moreover, a review of the research literature regarding computerised psychotherapies indicates that where proven techniques are adapted for computer delivery, clinical outcomes are comparable to traditional face-to-face services.<sup>(20,21)</sup> Studies with child populations have demonstrated some positive outcomes from web-based CBT for a range of anxiety disorders.<sup>(22-25)</sup> With the rapid rise in the popularity of computers and the Internet in the past decade, web-based programmes can be used as a platform to actively engage children in mental health treatment.

The use of cognitive strategies is possible in school-aged children with SM, as they are generally of normal intelligence and are able to communicate through non-verbal means in mute situations. Considering that these children exhibit heightened social anxiety/phobia, creating an environment that reduces interaction with the therapist through increased interface with the computer may allow them to be more at ease in receiving treatment, particularly at the initial sessions. As such, a web-based CBT programme may be particularly useful in the treatment of children with SM and may even further enhance the effectiveness of the treatment of SM.

A review of 23 studies on the treatment of SM, including psychodynamic, behavioural and cognitive-behavioural approaches, suggested that behavioural and cognitive-behavioural techniques appeared to be most effective for SM.<sup>(8)</sup> For example, Fung et al<sup>(26)</sup> presented a case study on a seven-year-old white Canadian boy using the 'Meeky Mouse' programme (a web-based CBT programme) and found improvements in anxiety symptoms and severity of SM post treatment. Findings from the case study support the use of a web-based CBT programme among children with SM. In another case study, Reuther et al<sup>(27)</sup> found that an eight-year-old Caucasian boy with SM improved in frequency of speech, anxiety symptoms and severity of SM following a 21-session Modular Cognitive-Behavioural Therapy for Childhood Anxiety Disorders,<sup>(28)</sup> which included psycho-education, exposure, cognitive restructuring, social skills, and maintenance and relapse prevention.

By and large, there is still a lack of empirical studies substantiating the effectiveness of treatment for SM.<sup>(29,30)</sup> There is a need to test the applicability of CBT for SM in diverse populations, which may allow examination of its generalised usage. To address this limitation, we examined the use of a culturally appropriate version of the 'Meeky Mouse' CBT programme in combination with treatment-as-usual in a group of five Singaporean Chinese children with SM. We documented the progress made by these children throughout their course of treatment utilising the 'Meeky Mouse' programme, and presented it as a case series study. Our hypothesis was that

children with SM would demonstrate improvements in the frequency of speech post treatment.

## METHODS

Five Singaporean Chinese children aged 6–11 (mean 9.00 ± 2.35) years, who were diagnosed with SM by the DSM-IV criteria from an outpatient child psychiatric clinic, participated in the study. They were referred to the study by their attending child psychiatrist. Their names have been changed in this paper to protect the confidentiality of the participants. Intellectual functioning was not tested formally, but all participants showed satisfactory academic performance in mainstream schools. Table 1 presents the participants' demographics, attendance rates and qualitative summaries of treatment progress.

The Selective Mutism Questionnaire (SMQ) is a 17-item parent-rated questionnaire that assesses a child's speaking behaviour and the situations associated with the failure to speak at home, school and other social situations.<sup>(31)</sup> Parents were asked to rate the items on a 4-point Likert scale (1 = Always, 2 = Often, 3 = Sometimes, 4 = Never). Higher scores on the SMQ indicated higher frequency of speech. The SMQ has been found to have adequate psychometric properties.<sup>(31)</sup>

We modified the original web-based CBT programme developed at the Hospital for Sick Children, Canada in order to make the situations culturally and socially appropriate for children in Singapore. For example, the language, analogies and scenarios/examples that are relevant to Singaporean children's cultural and social context are used. In addition, the main character 'Meeky' was written based on the cultural and social experiences of a typical Singaporean child (born and lives in Singapore). The 14-week 'Meeky Mouse' programme consists of eight training sessions, followed by six practice sessions (exposure using social skills training). Examples of topics within the programme included recognising feelings and bodily reactions, examining one's thoughts, building confidence and using the CHAT plan to improve social communication. Homework tasks for each session were submitted by the children weekly via the Internet. Parents were encouraged to work with their children on their homework. Details of the 'Meeky Mouse' programme are available for free at <http://www.imh.com.sg/quietroom>. The sample login id is 'Parents' and the password is '123'. Consultation with the authors was needed before placing the child through the 'Meeky Mouse' programme. Fig. 1 shows the login instructions and sample screenshots of the 'Meeky Mouse' programme. The 'Meeky Mouse' programme has been migrated to a new site ([www.quietroom.com.sg](http://www.quietroom.com.sg)) from March 2012 onwards.

The Institute of Mental Health's Clinical Research Committee (CRC Ref: 133/2005) and the National Healthcare Group's Domain Specific Review Board (DSRB Ref: A/05/171) approved this study. Parents provided written informed consent prior to enrolling their children in the 'Meeky Mouse' programme. All personal identifiers were removed, and data were kept confidential in accordance with the Institutional Review Board

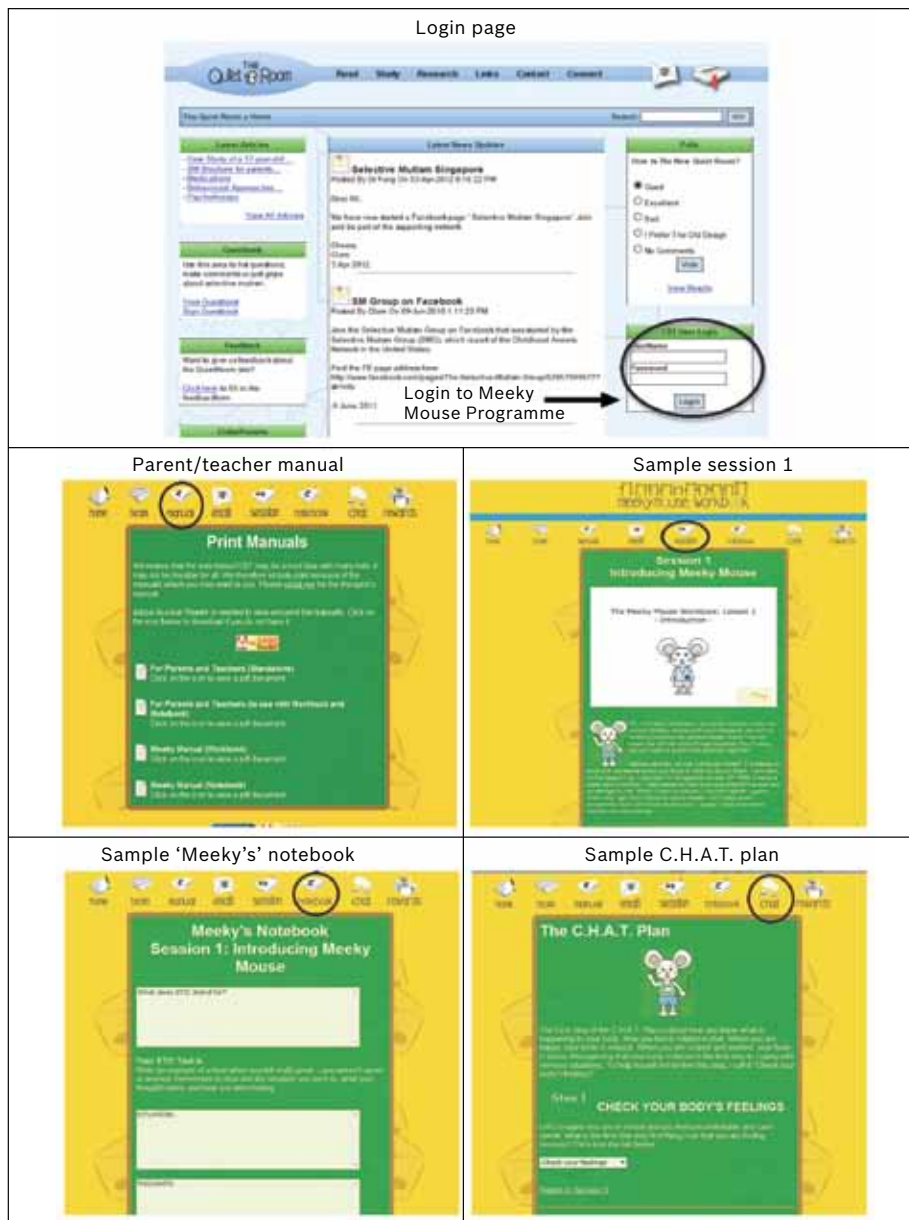


Fig. 1 Screenshots of the 'Meeky Mouse' programme.

research guidelines. Parents completed the SMQ during the first consultation with the psychiatrist (T1 pre-treatment) and at the end of the programme (T2 post-treatment). Qualitative therapist observations and parent/teacher's feedback were also used to document each child's progress throughout the 14-week study period. Treatment as usual, which included visits to their attending psychiatrist every four to six weeks, was continued throughout the 'Meeky Mouse' programme. Three out of the five children who were on fluoxetine 10–20 mg daily prior to the 'Meeky Mouse' programme continued the medication throughout the programme without altering the dosage.

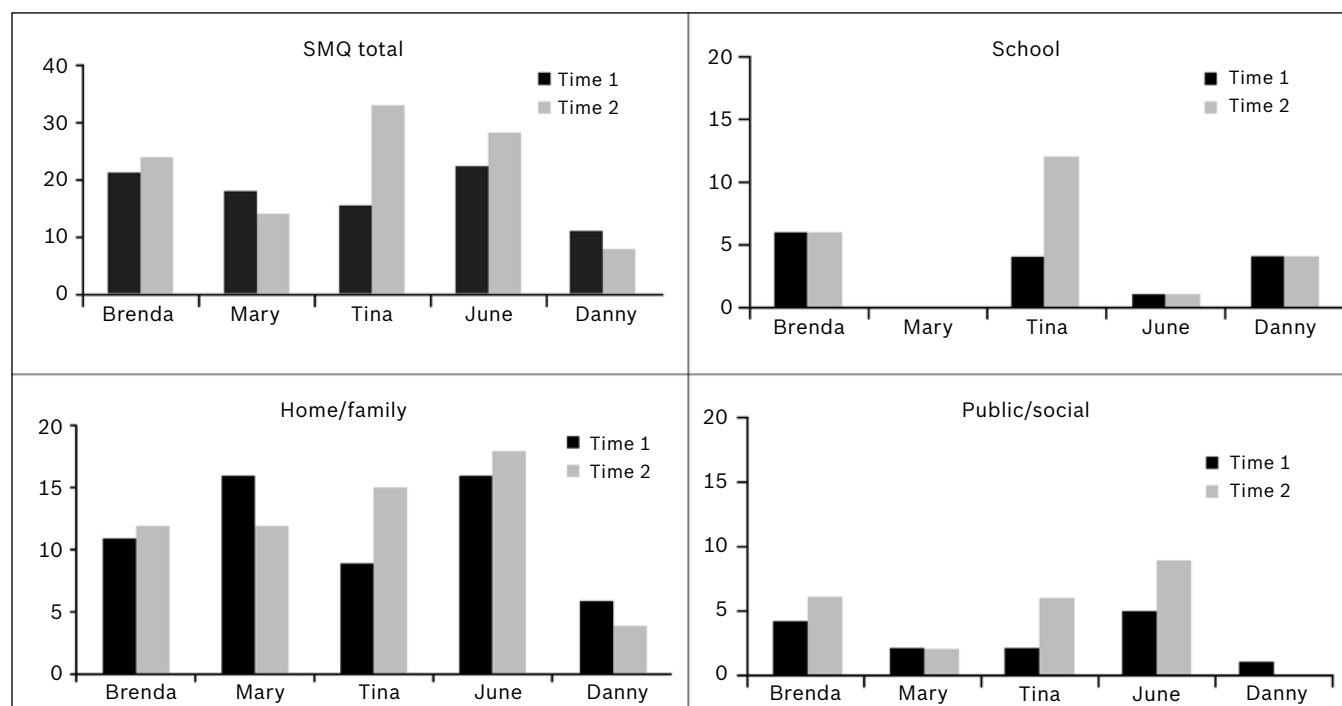
## RESULTS

Post treatment, four out of five of the children improved on their verbal communication in different settings (i.e. school, outside the home), which was noted by the therapist, parents and teachers. For example, Brenda was able to speak in soft whispers to her mother in front of others. She also initiated conversation with her

therapist and other familiar people. Danny spoke to his teachers in school, and to his friends over the phone but not face to face. Within the family setting, he talked to some of his aunts and uncles. June spoke to her teachers and friends in school. She also managed to buy her own food at the school canteen and at McDonalds. She read aloud to her teacher in a one-to-one situation and had more friends. Tina's teacher reported that she became very chatty in class. Tina spoke to the cashier at McDonalds and managed to buy a drink on her own. She also recited a poem for the therapist during one of the sessions. Only Mary did not communicate verbally with the therapist throughout the 14 sessions, but she was observed to show improvement in her overall behaviour and attitude during the 'Meeky Mouse' programme. She was also able to make audible sounds, which had not been evident in the earlier sessions. A summary of the progress made by the children is presented in Table I. Parent reports on the SMQ indicated that three out of the five children (i.e. Brenda, June and Tina) showed improvements in the frequency

**Table I. Demographics and summary of participants' progress across 14 weeks.**

Participant	Age (yrs) /gender	Medication	Attendance	Progress summary
Brenda	6/F	Fluoxetine 10 mg	100%	Whispered to some teachers in school; initiated conversation with her therapist and other familiar persons; and spoke to the therapist and her mother in front of others.
Mary	8/F	Not on medication	100%	Attended the session on her own (previously, she wanted her parents/brother to sit in with her); made some chirping noises in response to her therapist's questions and recorded her voice at home when singing a 'Beatles' song with her brother. The recording picked up some speech difficulties and she was then referred to the Speech and Language therapist at the end of the 'Meeky Mouse' programme. Mary did not speak to her therapist up to Session 14 but communicated with her non-verbally (i.e. through nods and gestures).
Tina	9/F	Not on medication	100%	Answered the therapist's questions in an audible tone instead of in low whispers; took part in role-plays with her therapist; spoke to some people in school such as the school librarian and her class teacher; spoke to the cashier at McDonalds and bought a drink on her own; and recited a poem in front of her class.
June	10/F	Fluoxetine 20 mg	100%	Talked to the therapist about her trip to Bali (a reward from her parents after the exams) among other topics; read aloud to her teacher in a one-to-one situation; and used the CHAT plan when she needed to buy food at the canteen and at McDonalds.
Danny	11/M	Fluoxetine 10mg	100%	Answered questions posed by his Math teacher in school; spoke to three different teachers; chatted with his friends over the phone; spoke to his aunts and uncles in family gatherings; and verbally thanked the therapist at the end of Session 14. Throughout the 14 sessions, Danny communicated with his therapist mainly through writing and drawings. He rarely spoke in monosyllables, with low whispers.



**Fig. 2** Graphs show the pre- and post-treatment SMQ scores. Note: SMQ: selective mutism questionnaire, Time 1: Pre-treatment, Time 2: Post-treatment. Lower scores represent less frequent speaking behaviour (more severe SM symptoms).

of speech in all settings, except for school setting, post treatment. Only one child (Tina) demonstrated improvement in the frequency of speech in the school setting following treatment. Fig. 2 presents the SMQ scores from pre- to post-treatment for each participant.

## DISCUSSION

This case series involving five Singaporean Chinese children provides preliminary support for a culturally appropriate, web-based CBT programme combined with treatment-as-usual for

treating SM. Post treatment, 80% of the participants improved on verbal communication in different settings (i.e. school, outside the home) based on the qualitative therapist's observations and parent's/teacher's feedback. In addition, all five children completed the entire course of web-based CBT, suggesting that this approach is acceptable to children with SM and their parents. On the SMQ, the majority of the parents (60%) reported post-treatment improvements in the frequency of their child's speech in all settings, except for the school setting. This is possibly due to the fact that the school setting presents a higher level of

stress compared to the home and other social settings, suggesting that a more intensive treatment or longer follow-up is required. It could also be that parents might not have been aware of the improvements made in schools.

Recent reviews suggest that CBT is an effective and promising treatment approach for SM.<sup>(8,32)</sup> It may also be worthwhile to consider incorporating a parent training component in addition to the child's treatment session. Khanna and Kendall<sup>(33)</sup> found that incorporating parent training in a trial on CBT for children with anxiety may contribute to improvements in the child's global functioning. Web-based CBT programme appears to be more accepting and less stress-provoking compared to traditional face-to-face therapy, as children with SM can communicate their feelings and thoughts using the computer. Clinicians are also able to monitor the child's progress and provide feedback at their own convenience.

Despite these encouraging findings, some caution is needed in interpreting the results from the present study. Firstly, in view of the small sample size, the data may not be reflective of the wider population of SM children. Secondly, treatment-as-usual for some of the children consisted of fluoxetine. Without a control group, we could not ascertain whether improvements were due to the 'Meeky Mouse' programme, medication or maturational processes. Thirdly, behavioural improvements (based on qualitative observations) were documented by the therapist. In order to avoid potential biases, ratings by an independent rater may be required. Finally, the SMQ is a parent rating scale, with the findings based solely on parent's impressions, and thus, possibly biased. A more comprehensive evaluation that includes the child and teacher ratings is necessary to provide a more holistic view. Future research is needed to replicate and to further confirm the findings regarding the effectiveness of CBT and combined treatment approaches among SM children in diverse populations.

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