and regional anti-stigma projects lasting a year or less have told me they felt let down at the end of the campaign — whether they are project organizers, volunteers, mental-health specialists or patients. No follow-up studies have been carried out to monitor the lasting effect of such short-lived campaigns, but people with mental illnesses especially report that after having their hopes raised, nothing had changed a year on.

To address the stigma of mental health in a meaningful way, strategies known to be effective should become a routine part of everyday services. These include educating health-care personnel, mediating face-to-face contact between the general public and people who have experienced mental illness, or persuading journalists to avoid certain terms when describing events relating to those with mental illness. Permanent networks of business people, journalists, social workers, mental-health experts, patients and volunteers need to be established. Also, goals should be tailored to local circumstances, by building and sustaining trusting relationships between everyone involved in the various anti-stigma efforts and patients and their families.

This is beginning to happen in some countries, including Germany, New Zealand, Brazil, Japan and the United Kingdom. For example, in Germany some of the education, media awareness and stigma research programmes started during Open the Doors are being continued on a long-term basis[9].

The overall lesson from Open the Doors is that stigma should be tackled in a fundamentally different way from most of the efforts carried out so far. Involving patients and their carers in the planning and evaluation of projects, for example, will result in a change in how programmes are constructed, funded and assessed. Likewise, including efforts to reduce stigma as a routine part of mental-health services will require a change in the organization and functioning of such institutions.

Stamping out stigma by altering the paradigms that have been the basis of most anti-stigma efforts will be difficult and costly. But doing so is crucial not only to improve the funding of mental-health programmes, the treatment of people with mental illness and their integration into society, but also to make our societies more civilized — a goal that concerns everyone. ■

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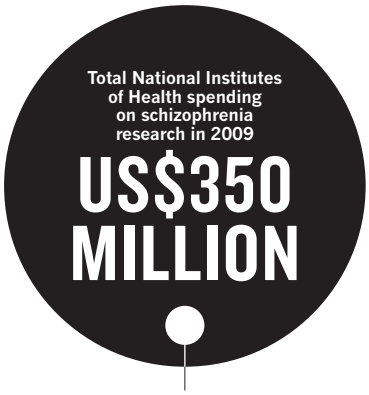
Cognitive remediation therapy needs funding

More rigorous studies should be done on the effects of a therapy that seems to improve the everyday functioning of people with schizophrenia, says **Til Wykes**.

Cognitive remediation therapy seems to enhance the attention span, memory retention and problem-solving skills of those with schizophrenia through the performance of simple tasks. It has few side effects and is relatively cheap. A three-month course costs about US$700; three months' supply of the schizophrenia drug clozapine costs nearly $900. And there is growing evidence that the therapy could be at least as valuable as the drugs currently used to treat delusions and hallucinations, in helping people with schizophrenia lead fuller lives.

Yet investment in research has been lacking. In 2009, the US National Institutes of Health (NIH) spent nearly $350 million on schizophrenia research, but dedicated only $4.1 million of this to studies of cognitive remediation therapy.

To win the support of funders and turn remediation therapy into a serious treatment option, the community of researchers investigating it needs to develop a more rigorous approach. It is time to develop models of how the training works, analyse how basic cognitive improvements help patients, and discover how best to implement the therapy and to whom it should be offered.



CLINICAL TRIALS

Medications for schizophrenia can reduce the degree to which patients experience delusions and hallucinations, but they are blunt instruments. Several medications recommended in national treatment guidelines, such as the UK National Institute for Health and Clinical Excellence, are associated with side effects such as weight gain or dribbling, and even worsened cognitive problems[1]. People's ability to lead a normal life is less affected by the degree to which they experience delusions and hallucinations following medication treatment than by problems with basic neuropsychological processes[2].

Various researchers worldwide began to develop cognitive remediation therapy in the late 1990s. The treatment involves mental-health professionals (social workers

or psychologists) coaching patients on tasks that boost memory, attention and other neurocognitive abilities. For instance, a patient might be asked to remember a set of numbers or pictures, and report them back in a certain order. They may then be shown how to improve their performance using a particular strategy, for example by splitting long lines of numbers into clusters of four.

More than 100 reports worldwide of controlled clinical trials involving some 2,000 people with schizophrenia now suggest that this type of training can improve the cognitive skills most closely tied to the ability to do things such as hold a job or develop relationships. Yet these studies are difficult to compare, and the resulting data tricky to pool. For instance, they use 99 different cognitive measures — among them, 'digit span' (the number of digits a patient can remember in a certain time) and 'processing speed' (how fast a person can manipulate and respond to information). Also, few models have been developed to explain how a therapy brings about cognitive changes, or why these changes affect a person's ability to function in everyday life.

Without this understanding, it is not clear which components of the therapy are likely to help a patient most. According to a recent meta-analysis[3], patients show greater improvement across a range of tasks when the therapy involves giving them the chance to practise. Yet their ability to function in everyday life is more closely tied to whether they are taught a strategy.

Another problem is that very few studies explore the differing effects the therapy has on different individuals. In one of the first studies of cognitive remediation for people with schizophrenia, I asked two male patients to say as many words beginning with the same letter as they could in a minute. Both participants improved their score, but one chose to call out words faster and made more mistakes in the process, whereas the other opted to make his choices more slowly and carefully. These differences in approach were associated with different activation patterns in brain scans[4].

By measuring whether people's performance improves, not whether it improves in the same way, we may be failing to tailor specific types of treatment to individuals — and so underestimating the overall effectiveness of cognitive remediation therapy.

SCIENTIFIC FOOTING

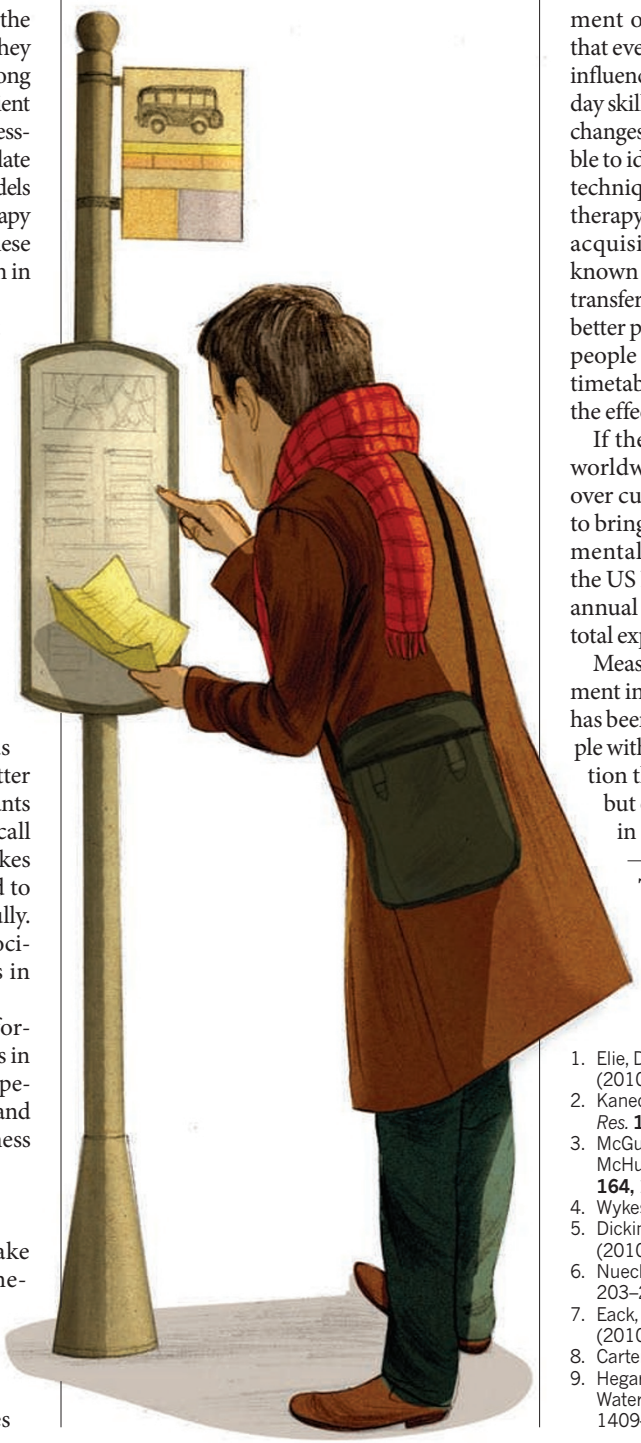
The research community must now take three key steps to put the study of remediation therapy on a more scientific footing, some of which are beginning to be taken by certain groups[5]. First, researchers must agree to use no more than ten standardized measures of performance. A group of mental-health specialists in the United States recently agreed on a list of those aspects such as memory, attention and learning likely to be most important in judging the effects of cognitive remediation therapy. This list — the MATRICS cognitive domains[6] — offers a useful starting point.

Second, to look for individual effects, researchers should stratify the participants of studies into classes — according to age for instance, or ways of learning. To obtain the larger data sets needed to do this, researchers studying cognitive remediation therapy should agree to consign their data to a new collaborative database. (Currently most researchers place their data in the public domain, but there is no agreement over which variables to collect or how to merge different data sets.) This could operate in much the same way as the NIH-funded Psychiatric Genomewide Association Study Consortium — a collaborative effort to link biomarkers to certain mental diseases.

Third, researchers should investigate how cognitive changes are brought about and the effect they have on a person's life, in addition to looking at how much cognitive improvement occurs. Meta-analyses have shown that even small cognitive improvements can influence a person's ability to perform day-to-day skills. If these small improvements reflect changes in neural processing, it may be possible to identify the latter using brain-imaging techniques[7,8]. Also, certain properties of the therapy, such as how transferable a patient's acquisition of skills is to new settings — known as metacognition — may enable the transfer of basic cognitive improvements into better performance in everyday life. Training people with schizophrenia to decipher bus timetables or maps, for example, may boost the effects of treatment in the real world.

If these steps are taken, I estimate that, worldwide, a $20-million hike in funding over current levels will be all that is needed to bring cognitive remediation therapy into mental-health services. This is 0.05% of the US National Institutes of Health's entire annual spending and only 6% of its current total expenditure on schizophrenia research.

Measures of functionality such as employment indicate that, in the past century, there has been no improvement to the lives of people with schizophrenia[9]. Cognitive remediation therapy might improve this outlook, but only if we research and implement it in a truly scientific manner. ■



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