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# Life skills programmes for chronic mental illnesses (Review)

Tungpunkom P, Maayan N, Soares-Weiser K

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[Intervention Review]

# Life skills programmes for chronic mental illnesses

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## ABSTRACT

### Background

Most people with schizophrenia have a cyclical pattern of illness characterised by remission and relapses. The illness can reduce the ability of self-care and functioning and can lead to the illness becoming disabling. Life skills programmes, emphasising the needs associated with independent functioning, are often a part of the rehabilitation process. These programmes have been developed to enhance independent living and quality of life for people with schizophrenia.

### Objectives

To review the effects of life skills programmes compared with standard care or other comparable therapies for people with chronic mental health problems.

### Search methods

We searched the Cochrane Schizophrenia Group Trials Register (June 2010). We supplemented this process with handsearching and scrutiny of references. We inspected references of all included studies for further trials.

### Selection criteria

We included all relevant randomised or quasi-randomised controlled trials for life skills programmes versus other comparable therapies or standard care involving people with serious mental illnesses.

### Data collection and analysis

We extracted data independently. For dichotomous data we calculated relative risks (RR) and their 95% confidence intervals (CI) on an intention-to-treat basis, based on a random-effects model. For continuous data, we calculated mean differences (MD), again based on a random-effects model.

### Main results

We included seven randomised controlled trials with a total of 483 participants. These evaluated life skills programmes versus standard care, or support group. We found no significant difference in life skills performance between people given life skills training and standard care (1 RCT, n = 32, MD -1.10; 95% CI -7.82 to 5.62). Life skills training did not improve or worsen study retention (5 RCTs, n = 345, RR 1.16; 95% CI 0.40 to 3.36). We found no significant difference in PANSS positive, negative or total scores between life skills intervention and standard care. We found quality of life scores to be equivocal between participants given life skills training (1 RCT, n = 32, MD -0.02; 95% CI -0.07 to 0.03) and standard care. Life skills compared with support groups also did not reveal any significant differences in PANSS scores, quality of life, or social performance skills (1 RCT, n = 158, MD -0.90; 95% CI -3.39 to 1.59).


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**Authors' conclusions**

Currently there is no good evidence to suggest life skills programmes are effective for people with chronic mental illnesses. More robust data are needed from studies that are adequately powered to determine whether life skills training is beneficial for people with chronic mental health problems.

## PLAIN LANGUAGE SUMMARY

**Life skills programmes for chronic mental illnesses**

Having a mental health problem can cause difficulties and obstacles in all areas of life, even those as simple as washing, shopping, talking openly with other people, brushing teeth, cleaning the house, managing money, making friends, shaving and being independent. Having a mental health problem, combined with the sleep-like haze of many antipsychotic medications, limits people's ability to look after themselves, socialise with other people, take part in education or career development and find work.

Life skills programmes attempt to remedy some of these difficulties by encouraging independent living, so enhancing quality of life. Life skills often have several components: communication and talking; financial awareness and money management; domestic tasks (such as cooking, washing- up dishes, hoovering, doing the laundry and running a home); and personal self-care (such as washing, bathing, cleaning teeth, shaving, combing hair and getting dressed). Other life skills include training on coping with stress, shopping for and eating healthy food, knowing the time, taking medication, improving social skills, using transport and forward planning.

Rehabilitation or getting better is slow, complex and difficult. There are many ways of engaging with people during this process, including: creative therapies (art, drama, music, poetry, education, dancing, singing); life skills (as described above); work-based therapy to enhance employment; and recreational activities (such as group walks, swimming, sport, reading, writing a diary, watching television, going to parties, events and day trips).

This review looks at different types of rehabilitation therapy for people with mental health problems. It compares life skills training with occupational therapy and peer support (where a group of people with mental health problems were encouraged to help each other). Comparison was also made with standard or usual care. Life skills, occupational therapy and peer support all aim to promote health by enabling people to perform meaningful and purposeful activities.

In the main, the authors of the review conclude that there is no great difference between those that receive life skills, occupational therapy, peer support and standard care. It is questionable if people should be put under pressure to attend life skills and not known whether life skills are a benefit or perhaps even harmful. Professionals and service users invest much time in life skills and this may cost both time and money. However, the quality of scientific evidence is low and uncertain. The authors note that life skills are still a simple and easy way that has the potential to make great benefits for people who are almost disabled by mental health problems.

This plain language summary has been prepared by Ben Gray of Rethink Mental Illness: Benjamin Gray, Service User and Service User Expert, Rethink Mental Illness. Email: ben.gray@rethink.org


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## SUMMARY OF FINDINGS

### Summary of findings for the main comparison. Life skills programme compared to standard care for chronic mental illnesses

**Life skills programme compared to standard care for chronic mental illnesses**

**Patient or population:** patients with chronic mental illnesses
**Settings:** day hospital
**Intervention:** Life skills programme
**Comparison:** standard care

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | standard care | Life skills programme | | | | |
| **Life skills: No important change in household activity skills**<br>Royal Edinburgh Occupational Therapy Assessment Form<br>Follow-up: mean 12 weeks | **250 per 1000** | **60 per 1000**<br>(2 to 1000) | **RR 0.24**<br>(0.01 to 4.72) | 10<br>(1 study) | ⊕⊝⊝⊝<br>**very low** [1,2,3] | |
| **Life skills: No important change kitchen skills**<br>Royal Edinburgh Occupational Therapy Assessment Form<br>Follow-up: mean 12 weeks | See comment | See comment | Not estimable | 10<br>(1 study) | ⊕⊝⊝⊝<br>**very low** [1,2,3] | |
| **Life skills: No important change laundry skills**<br>Royal Edinburgh Occupational Therapy Assessment Form<br>Follow-up: mean 12 weeks | **500 per 1000** | **70 per 1000**<br>(5 to 1000) | **RR 0.14**<br>(0.01 to 2.38) | 10<br>(1 study) | ⊕⊝⊝⊝<br>**very low** [1,2,3] | |
| **Life skills: No important change self-care skills**<br>Royal Edinburgh Occupational Therapy Assessment Form<br>Follow-up: mean 12 weeks | **500 per 1000** | **500 per 1000**<br>(140 to 1000) | **RR 1**<br>(0.28 to 3.54) | 10<br>(1 study) | ⊕⊝⊝⊝<br>**very low** [1,2,3] | |
| **Leaving the study early**<br>Follow-up: 6 to 16 weeks | **29 per 1000** | **34 per 1000**<br>(12 to 97) | **RR 1.16**<br>(0.4 to 3.36) | 345<br>(5 studies) | ⊕⊝⊝⊝<br>**very low** [2,4,5] | |

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|---|---|---|---|---|---|
| **Mental state: endpoint score**<br>PANSS positive syndrome. Scale from: 7 to 48.<br>Follow-up: mean 24 weeks | The mean mental state: endpoint score in the control groups was **23.9** | The mean Mental state: endpoint score in the intervention groups was **0 higher** (3.12 lower to 3.12 higher) | | 32<br>(1 study) | ⊕⊖⊖⊖<br>**very low** [3,6,7] |
| **Quality of life: Endpoint score**<br>Quality of Well-Being Scale index. Scale from: 0 to 10.<br>Follow-up: mean 24 weeks | The mean quality of life: endpoint score in the control groups was **-0.49** | The mean Quality of life: endpoint score in the intervention groups was **0.02 lower** (0.07 lower to 0.03 higher) | | 32<br>(1 study) | ⊕⊖⊖⊖<br>**very low** [3,6,7] |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
**CI:** Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] The one RCT that provided data for this outcome had unclear sequence generation and allocation concealment. It was not blinded. It was not free of selective reporting and it was unclear if it was free of other biases.
[2] The 95% confidence intervals are very wide and include both significant benefit and harm of the intervention.
[3] Only one study reported on this outcome.
[4] Of the five RCTs that provided data for this outcome, only two had adequate sequence generation and it was unclear in all whether there was adequate allocation concealment. One study was single blinded and the remaining were not stated to be blinded. Three the trials dealt with missing data adequately and none of the trials reported all expected outcomes. It was unclear whether any of the trials were free from selective reporting.
[5] Five studies reported this outcome, but we excluded many similar studies published in China because of lack of adequate randomisation. It is less likely that small, negative studies have been published.
[6] The one RCT that provided data for this outcome had unclear sequence generation and allocation concealment. It was not free from selective reporting and did not address incomplete data. It was unclear of it was free from other biases.
[7] The 95% confidence intervals include both significant benefit and harm of the intervention.

## Summary of findings 2. Life skills programme compared to attention-control for chronic mental illnesses

**Life skills programme compared to attention-control for chronic mental illnesses**

**Patient or population:** patients with chronic mental illnesses
**Settings:** board and care facility in community


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**Intervention:** Life skills programme
**Comparison:** attention-control

| Outcomes | Illustrative comparative risks* (95% CI) | | Relative effect (95% CI) | No of Participants (studies) | Quality of the evidence (GRADE) | Comments |
|---|---|---|---|---|---|---|
| | Assumed risk | Corresponding risk | | | | |
| | attention-control | Life skills programme | | | | |
| **Life skills: Endpoint score**<br>UCSD Performance-based Skills Assessment - UPSA<br>Follow-up: mean 24 weeks | The mean life skills: endpoint score in the control groups was<br>**-68.2** | The mean Life skills: Endpoint score in the intervention groups was<br>**2.5 lower**<br>(8.94 lower to 3.94 higher) | | 158<br>(1 study) | ⊕⊖⊖⊖<br>**very low** [1,2,3] | |
| **Mental state: Endpoint score**<br>PANSS. Scale from: 16 to 96.<br>Follow-up: mean 24 weeks | The mean mental state: endpoint score in the control groups was<br>**59.1** | The mean Mental state: Endpoint score in the intervention groups was<br>**2.7 higher**<br>(4.78 lower to 10.18 higher) | | 158<br>(1 study) | ⊕⊖⊖⊖<br>**very low** [1,2,3] | |
| **Quality of life: Endpoint score**<br>Quality of Well-Being Scale. Scale from: 0 to 100.<br>Follow-up: mean 24 weeks | The mean quality of life: endpoint score in the control groups was<br>**-55.9** | The mean Quality of life: Endpoint score in the intervention groups was<br>**0.9 higher**<br>(3.12 lower to 4.92 higher) | | 158<br>(1 study) | ⊕⊖⊖⊖<br>**very low** [1,2,3] | |

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
**CI:** Confidence interval;

GRADE Working Group grades of evidence
**High quality:** Further research is very unlikely to change our confidence in the estimate of effect.
**Moderate quality:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
**Low quality:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
**Very low quality:** We are very uncertain about the estimate.

[1] The one RCT that provided data for this outcome had unclear sequence generation and allocation concealment. It was not free from selective reporting and it was unclear whether it was free from other biases.
[2] The 95% confidence intervals are wide and include both significant benefit and harm of the intervention.
[3] Only one study reported on this outcome.


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# BACKGROUND

## Description of the condition

Schizophrenia can occur as a single episode of illness. By far the greater proportion of sufferers, however, have remission and relapses; for many of those who develop schizophrenia it becomes a chronic and often disabling illness (Bustillo 2000).

## Description of the intervention

People with schizophrenia often receive different types of treatment concurrently. Medication is commonly used for the management of symptoms but the social disability which often accompanies the illness can require a variety of psychological, nursing and occupational therapies (Marlowe 2003; Pines 2000). These treatments are incorporated under the general term 'rehabilitation'. The elements of a rehabilitation package for a person with a chronic mental illness, whether in the community or in hospital, may include creative therapies: art (Ruddy 2005), drama (Ruddy 2007), music (Gold 2005), poetry, educational activities (Bhoopathi 2006), life skills programmes (Robertson 1998), work-based therapy, and recreational activities (Hume 1995).

## How the intervention might work

Life skills programmes, a frequent element of the rehabilitation process, address the needs associated with independent functioning. This can involve encouraging financial awareness, communication, domestic, personal self-care and community living skills.

## Why it is important to do this review

Preceding the movement of care into the community, the rehabilitation process was mostly provided by the large mental health institutions in which sufferers often spent many years (Wing 1970). This pattern of care has changed (Hume 1995). Currently, few chronically mentally ill people, perhaps with the exception of those in a secure forensic setting, spend longer than a few weeks per year in hospital, and most care, certainly within the UK, is community-based (Davies 1990; Leff 1992). Relative to other chronic illnesses, the personal and economic costs of schizophrenia are considerable (Bustillo 2000; Knapp 1994).

# OBJECTIVES

To evaluate the effects of life skills programmes for people with chronic mental health problems compared with standard care or other interventions.

# METHODS

## Criteria for considering studies for this review

### Types of studies

We included all relevant randomised or quasi-randomised controlled trials. We compared results from trials that used quasi-random allocation, such as by day of week or month, in sensitivity analyses with trials using more robust means of randomisation.

### Types of participants

We included adults between the ages of 18 to 60 years with chronic mental illnesses diagnosed by any criteria. We excluded trials involving people with dementia, alcoholism, serious suicidal risk, and organic brain syndrome.

### Types of interventions

#### *1. Life skills programmes*

These were defined as any group or individual programme involving independent functioning in daily living. These programmes could include training in managing money, organising and running a home, domestic skills and personal self-care and related interpersonal skills. Evaluation of specific social skills training was not a focus of this review.

We considered programmes of five sessions or less as 'brief', and six or more as 'other'. For the purposes of this review, we defined place of residence as either 'hospital' or 'community'. For example, if people were in hospital at the time of attending a day hospital-based programme they were considered to be receiving 'hospital-based' care. If, on the other hand, they attended the day hospital from home then they were considered to be receiving 'community-based' care. Trained staff were those personnel who held a professionally recognised healthcare qualification.

#### *2. Attention control condition*

A support group session that provided a supportive environment for addressing personal problems.

#### *3. Standard care*

The normal level of psychiatric care provided in the area where the trial is being carried out.

### Types of outcome measures

The primary outcomes were self-care functioning at personal and domestic level (life skills).

We defined a clinically significant response as at least a 50% reduction on any scale. We grouped outcomes into brief (five sessions and less) and other (six sessions or more).

#### *Primary outcomes*

**1. Life skills**

1.1 No clinically important change in general life skills

**2. Relapse**

**3. Mental state**

3.1 No clinically important change in general mental state

#### *Secondary outcomes*

**1. Life skills**

1.2 Average endpoint general life skills score
1.3 Average change in general life skills scores
1.4 No clinically important change in specific life skills
1.5 Average endpoint specific life skills score
1.6 Average change in specific life skills scores

**2. Global state**

2.1 No clinically important change in global state (as defined by individual studies)
2.2 Average endpoint global state score


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2.3 Average change in global state scores

**3. Service outcomes**

3.1 Hospitalisation
3.2 Time to hospitalisation

**4. Mental state**

4.1 Average endpoint general mental state score
4.2 Average change in general mental state scores
4.3 No clinically important change in specific symptoms (positive symptoms of schizophrenia, negative symptoms of schizophrenia, depression, mania)
4.4 Average endpoint specific symptom score
4.5 Average change in specific symptom scores

**5. General functioning**

5.1 No clinically important change in general functioning
5.2 Average endpoint general functioning score
5.3 Average change in general functioning scores
5.4 No clinically important change in specific aspects of functioning, such as social or life skills
5.5 Average endpoint specific aspects of functioning, such as social or life skills
5.6 Average change in specific aspects of functioning, such as social or life skills

**6. Behaviour**

6.1 No clinically important change in general behaviour
6.2 Average endpoint general behaviour score
6.3 Average change in general behaviour scores
6.4 No clinically important change in specific aspects of behaviour
6.5 Average endpoint specific aspects of behaviour
6.6 Average change in specific aspects of behaviour

**7. Adverse effects - general and specific**

7.1 Clinically important general adverse effects
7.2 Average endpoint general adverse effect score
7.3 Average change in general adverse effect scores
7.4 Clinically important specific adverse effects
7.5 Average endpoint specific adverse effects
7.6 Average change in specific adverse effects
7.7 Death - suicide and natural causes

**8. Engagement with services**

**9. Satisfaction with treatment**

9.1 Leaving the studies early
9.2 Recipient of care not satisfied with treatment
9.3 Recipient of care average satisfaction score
9.4 Recipient of care average change in satisfaction scores
9.5 Carer not satisfied with treatment
9.6 Carer average satisfaction score
9.7 Carer average change in satisfaction scores

**10. Quality of life**

10.1 No clinically important change in quality of life
10.2 Average endpoint quality of life score
10.3 Average change in quality of life scores
10.4 No clinically important change in specific aspects of quality of life
10.5 Average endpoint specific aspects of quality of life
10.6 Average change in specific aspects of quality of life

**11. Economic outcomes**

11.1 Direct costs
11.2 Indirect costs

## Search methods for identification of studies

### Electronic searches

***1. Cochrane Schizophrenia Group's Register (June 2010)***

We searched this register using the phrase:

[(rehabilit* or adl* or life?skill* or life?program* or social?skill* or social?program* or self?care skill* or self?care program* or living?skill* or living?program* or community?skill* or community?program*) or ((daily and living) or (independent* and function*)) in title, abstract, index terms of REFERENCE] or [*life* or *living* in interventions of STUDY]

This register is compiled by systematic searches of major databases, handsearches and conference proceedings (see Group Module).

***2. Details of previous electronic searches***

See Appendix 1

### Searching other resources

***1. Reference searching***

We inspected references of all identified studies for further relevant studies.

***2. Personal contact***

We contacted the first author of each included study for information regarding unpublished trials.

## Data collection and analysis

### Selection of studies

In the previous version of this review, PT and MN independently inspected all reports. In the latest version, review author NM inspected all abstracts of studies identified as above and identified potentially relevant reports. In addition, to ensure reliability, KSW inspected a random sample of these abstracts, comprising 10% of the total.

Where disagreement occurred, we resolved it by discussion, or where there was still doubt, we acquired the full article for further inspection. We acquired the full articles of relevant reports for reassessment and we carefully inspected these for a final decision on inclusion (see Criteria for considering studies for this review). Once we obtained the full articles, in turn NM and KSW inspected all full reports and independently decided whether they met inclusion criteria. NM and KSW were not blinded to the names of the authors, institutions or journal of publication. The Chinese papers were inspected by a speaker of that language (JX).


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## Data extraction and management

### *1. Data extraction*

In the previous version of this review, PT independently extracted data from selected trials, while MN separately re-extracted information from two different samples (10%). When disputes arose, we attempted to resolve these by discussion. When this was not possible and further information was necessary to resolve the dilemma, data were not entered and we added the trial to the list of those awaiting assessment.

In the latest version, the data from the Chinese papers were extracted by a speaker of that language (JX). There was no check done by a second review author on the Chinese language studies.

### *2. Management*

#### 2.1 Forms

We extracted data onto standard, simple forms.

#### 2.2 Scale-derived data

We included continuous data from rating scales only if:

a. the psychometric properties of the measuring instrument had been described in a peer-reviewed journal (Marshall 2000); and
b. the measuring instrument was not written or modified by one of the trialists for that particular trial; and
c. the measuring instrument was either i. a self-report or ii. completed by an independent rater or relative (not the therapist).

#### 2.3 Endpoint versus change data

There are advantages of both endpoint and change data. Change data can remove a component of between-person variability from the analysis. On the other hand, calculation of change needs two assessments (baseline and endpoint) which can be difficult in unstable and difficult to measure conditions such as schizophrenia. We decided primarily to use endpoint data and only use change data if the former were not available. We combined endpoint and change data in the analysis as we used mean differences (MD) rather than standardised mean differences (SMD) throughout (Higgins 2008, chapter 9.4.5.2 ).

#### 2.4 Skewed data

Continuous data on clinical and social outcomes are often not normally distributed. To avoid the pitfall of applying parametric tests to non-parametric data, we aimed to apply the following standards to all data before inclusion: a) standard deviations (SDs) and means are reported in the paper or obtainable from the authors; b) when a scale starts from the finite number zero, the SD, when multiplied by two, is less than the mean (as otherwise the mean is unlikely to be an appropriate measure of the centre of the distribution, (Altman 1996); c) if a scale started from a positive value (such as Positive and Negative Syndrome Scale (PANSS) which can have values from 30 to 210), we modified the calculation described above to take the scale starting point into account. In these cases skew is present if 2 SD > (S-S min), where S is the mean score and S min is the minimum score. Endpoint scores on scales often have a finite start and end point and these rules can be applied. When continuous data are presented on a scale that includes a possibility of negative values (such as change data), it is difficult to tell whether data are skewed or not. Skewed data from studies of less than 200 participants were entered in additional tables rather than into an analysis Skewed data pose less of a problem when looking at means if the sample size is large and were entered into syntheses.

#### 2.5 Common measure

To facilitate comparison between trials, we intended to convert variables that can be reported in different metrics, such as days in hospital (mean days per year, per week or per month) to a common metric (e.g. mean days per month).

#### 2.6 Conversion of continuous to binary

Where possible, we attempted to convert outcome measures to dichotomous data. This could be done by identifying cut-off points on rating scales and dividing participants accordingly into 'clinically improved' or 'not clinically improved'. It was generally assumed that if there had been a 50% reduction in a scale-derived score such as the Brief Psychiatric Rating Scale (BPRS, Overall 1962) or the PANSS (Kay 1986), this could be considered as a clinically significant response (Leucht 2005a; Leucht 2005b). If data based on these thresholds were not available, we used the primary cut-off presented by the original authors.

#### 2.7 Direction of graphs

Where possible, we entered data in such a way that the area to the left of the line of no effect indicates a favourable outcome for intensive case management.

#### 2.8 Summary of findings table

We anticipated including the following short-term or medium-term outcomes in a 'Summary of findings' table.
i. Life skills (household activities, kitchen skills, laundry skills, self-care skills).
ii. Leaving the study early.
iii. Mental state (PANSS).
iv. Quality of life (Quality of Well-Being Scale Index).

## Assessment of risk of bias in included studies

KSW and NM independently assessed the risk of bias of each trial using The Cochrane Collaboration's 'Risk of bias' tool (Higgins 2008). We created a form following the guidance to make judgments on the risk of bias, in six domains: sequence generation; allocation concealment; blinding (of participants, personnel, and outcome assessors); incomplete outcome data; selective outcome reporting; and other sources of bias. We categorized these judgments as 'yes' (low risk of bias), 'no' (high risk of bias), or 'unclear'. We resolved disagreements through discussion and by consulting with the co-ordinating editor of the Cochrane Schizophrenia Group, Clive Adams (CEA).

## Measures of treatment effect

### *1. Binary data*

For binary outcomes, we calculated a standard estimation of the risk ratio (RR) and its 95% CI. It has been shown that RR is more intuitive (Boissel 1999) than odds ratios and that odds ratios tend to be interpreted as RR by clinicians (Deeks 2000). For statistically significant results, we had planned to calculate the number needed to treat to provide benefit /to induce harm statistic (NNTB/H), and its 95% CI using Visual Rx (http://www.nntonline.net/) taking account of the event rate in the control group. This, however, was superseded by Summary of findings for the main comparison and Summary of findings 2, and the calculations therein.


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### *2. Continuous data*

For continuous outcomes, we estimated MD between groups. We preferred not to calculate effect size measures (SMD). However, had scales of very considerable similarity been used, we would have presumed there was a small difference in measurement, and we would have calculated effect size and transformed the effect back to the units of one or more of the specific instruments.

## Unit of analysis issues

### *1. Cluster trials*

Studies increasingly employ 'cluster randomisation' (such as randomisation by clinician or practice) but analysis and pooling of clustered data poses problems. Firstly, authors often fail to account for intra-class correlation in clustered studies, leading to a 'unit of analysis' error (Divine 1992) whereby P values are spuriously low, CIs unduly narrow and statistical significance overestimated. This causes type I errors (Bland 1997; Gulliford 1999).

Where clustering was not accounted for in primary studies, we planned to present data in a table, with a (*) symbol to indicate the presence of a probable unit of analysis error. In subsequent versions of this review we will seek to contact first authors of studies to obtain intra-class correlation coefficients (ICCs) for their clustered data and to adjust for this by using accepted methods (Gulliford 1999). Where clustering had been incorporated into the analysis of primary studies, we present these data as if from a non-cluster randomised study, but adjusted for the clustering effect.

We have sought statistical advice and have been advised that the binary data as presented in a report should be divided by a 'design effect'. This is calculated using the mean number of participants per cluster (m) and the ICC [Design effect = 1+(m-1)*ICC] (Donner 2002). If the ICC was not reported, we assumed it to be 0.1 (Ukoumunne 1999).

If cluster studies has been appropriately analysed taking into account ICCs and relevant data documented in the report, synthesis with other studies would have been possible using the generic inverse variance technique.

### *2. Cross-over trials*

A major concern of cross-over trials is the carry-over effect. It occurs if an effect (e.g. pharmacological, physiological or psychological) of the treatment in the first phase is carried over to the second phase. As a consequence on entry to the second phase the participants can differ systematically from their initial state despite a wash-out phase. For the same reason cross-over trials are not appropriate if the condition of interest is unstable (Elbourne 2002). As both effects are very likely in severe mental illness, we planned to use only data from the first phase of cross-over studies.

### *3. Studies with multiple treatment groups*

Where a study involved more than two treatment arms, if relevant, we presented the additional treatment arms in comparisons. Where the additional treatment arms were not relevant, we did not reproduce these data.

## Dealing with missing data

### *1. Overall loss of credibility*

At some degree of loss of follow-up, data must lose credibility (Xia 2007). For any particular outcome should more than 50% of data be unaccounted for, we did not reproduce these data or use them within analyses. If, however, more than 50% of those in one arm of a study were lost, but the total loss was less than 50%, we marked such data with (*) to indicate that such a result may well be prone to bias.

### *2. Binary*

In the case where attrition for a binary outcome is between 0% and 50% and where these data were not clearly described, we presented the data on a 'once-randomised-always-analyse' basis (an intention-to-treat analysis). We assumed that all those leaving the study early to have the same rates of negative outcome as those who completed, with the exception of the outcome of death. We undertook a sensitivity analysis to test how prone the primary outcomes were to change when 'completed' data only were compared with the intention-to-treat analysis using the above assumption.

### *3. Continuous*

#### 3.1 Attrition

In the case where attrition for a continuous outcome is between 0% and 50% and completer-only data were reported, we have reproduced these.

#### 3.2 Standard deviations

Where there were missing measures of variance for continuous data but an exact standard error (SE) and CI were available for group means, and either P value or t value were available for differences in mean, we calculated them according to the rules described in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2008): When only the SE is reported, standard deviations (SDs) are calculated by the formula SD = SE * square root (n). Chapters 7.7.3 and 16.1.3 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2008) present detailed formulae for estimating SDs from P values, t or F values, CIs, ranges or other statistics. If these formula did not apply, we calculated the SDs according to a validated imputation method which is based on the SDs of the other included studies (Furukawa 2006). Although some of these imputation strategies can introduce error, the alternative would be to exclude a given study's outcome and thus to lose information. We nevertheless examined the validity of the imputations in a sensitivity analysis excluding imputed values.

#### 3.3 Last observation carried forward

We anticipated that in some studies the method of last observation carried forward (LOCF) would be employed within the study report. As with all methods of imputation to deal with missing data, LOCF introduces uncertainty about the reliability of the results. Therefore, where LOCF data has been used in the trial, if less than 50% of the data had been assumed, we reproduced these data and indicated that they are the product of LOCF assumptions.


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### Assessment of heterogeneity

#### *1. Clinical heterogeneity*

We considered all included studies initially, without seeing comparison data, to judge clinical heterogeneity. We simply inspected all studies for clearly outlying situations or people which we had not predicted would arise. When such situations or participant groups arose, we discussed these fully.

#### *2. Methodological heterogeneity*

We considered all included studies initially, without seeing comparison data, to judge methodological heterogeneity. We simply inspected all studies for clearly outlying methods which we had not predicted would arise. When such methodological outliers arose, we discussed these fully.

#### *3. Statistical heterogeneity*

##### 3.1 Visual inspection

We visually inspected graphs to investigate the possibility of statistical heterogeneity.

##### 3.2 Employing the $I^2$ statistic

We investigated heterogeneity between studies by considering the $I^2$ method alongside the $Chi^2$ P value. The $I^2$ provides an estimate of the percentage of inconsistency thought to be due to chance (Higgins 2003). The importance of the observed value of $I^2$ depends on i. magnitude and direction of effects and ii. strength of evidence for heterogeneity (e.g. P value from $Chi^2$ test, or a CI for $I^2$). We interpreted an $I^2$ estimate greater than or equal to 50% accompanied by a statistically significant $Chi^2$ statistic as evidence of substantial levels of heterogeneity (Section 9.5.2 - Higgins 2008). When substantial levels of heterogeneity were found in the primary outcome, we explored reasons for heterogeneity (Subgroup analysis and investigation of heterogeneity).

### Assessment of reporting biases

Reporting biases arise when the dissemination of research findings is influenced by the nature and direction of results (Egger 1997). These are described in Section 10 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2008). We are aware that funnel plots may be useful in investigating reporting biases but are of limited power to detect small-study effects. We intended not to use funnel plots for outcomes where there were ten or fewer studies, or where all studies were of similar sizes. In other cases, if funnel plots were possible, we would have sought statistical advice in their interpretation.

### Data synthesis

Where possible we employed a random-effects model for analyses. We understand that there is no closed argument for preference for use of fixed-effect or random-effects models. The random-effects method incorporates an assumption that different studies are estimating different, yet related, intervention effects. According to our hypothesis of an existing variation across studies, to be explored further in the meta-regression analysis despite being cautious that random-effects methods does put added weight onto the smaller of the studies - we favoured using random-effects model.

### Subgroup analysis and investigation of heterogeneity

#### *1. Subgroup analyses*

We planned to conduct subgroup analyses, but as there are only seven trials included the review it was not possible.

#### *2. Investigation of heterogeneity*

Where inconsistency was high, this was reported. First, we investigated whether data had been entered correctly. Second, if data had been entered correctly, we visually inspected the graph and we removed outlying studies to see if heterogeneity was restored. If no more than 10% of the data were excluded, we presented the data. If not, we did not pool the data but discussed relevant issues.

When unanticipated clinical or methodological heterogeneity was obvious, we simply stated hypotheses regarding these for future reviews or versions of this review. We did not anticipate undertaking analyses relating to these.

### Sensitivity analysis

#### *1. Implication of randomisation*

We aimed to include trials in a sensitivity analysis if they were described in some way as to imply randomisation. For the primary outcomes, we included these studies and if there was no substantive difference when the implied randomised studies were added to those with better description of randomisation, then we used all the data from these studies.

#### *2. Assumptions for lost binary data*

Where assumptions had to be made regarding people lost to follow-up (see Dealing with missing data), we compared the findings of the primary outcomes when we used our assumption compared with completer data only. If there was a substantial difference, we reported results and discussed them but we continued to employ our assumption.

Where assumptions had to be made regarding missing SDs data (see Dealing with missing data), we compared the findings on primary outcomes when we used our assumption compared with complete data only. A sensitivity analysis was undertaken testing how prone results were to change when 'complete' data only were compared with the imputed data using the above assumption. If there was a substantial difference, we reported results and discussed them but continued to employ our assumption.

## RESULTS

### Description of studies

Please see Characteristics of included studies, Characteristics of excluded studies, and Characteristics of ongoing studies.

### Results of the search

The 2010 update search identified 572 references. Agreement about which reports may have been randomised was 100% and we selected and ordered 20 of the original reports. Three reports are new studies to this review (Chen 2009; Zhao 2007; Zheng 2006) and two are ongoing studies (NCT00071591; NCT00069433) (Figure 1) .


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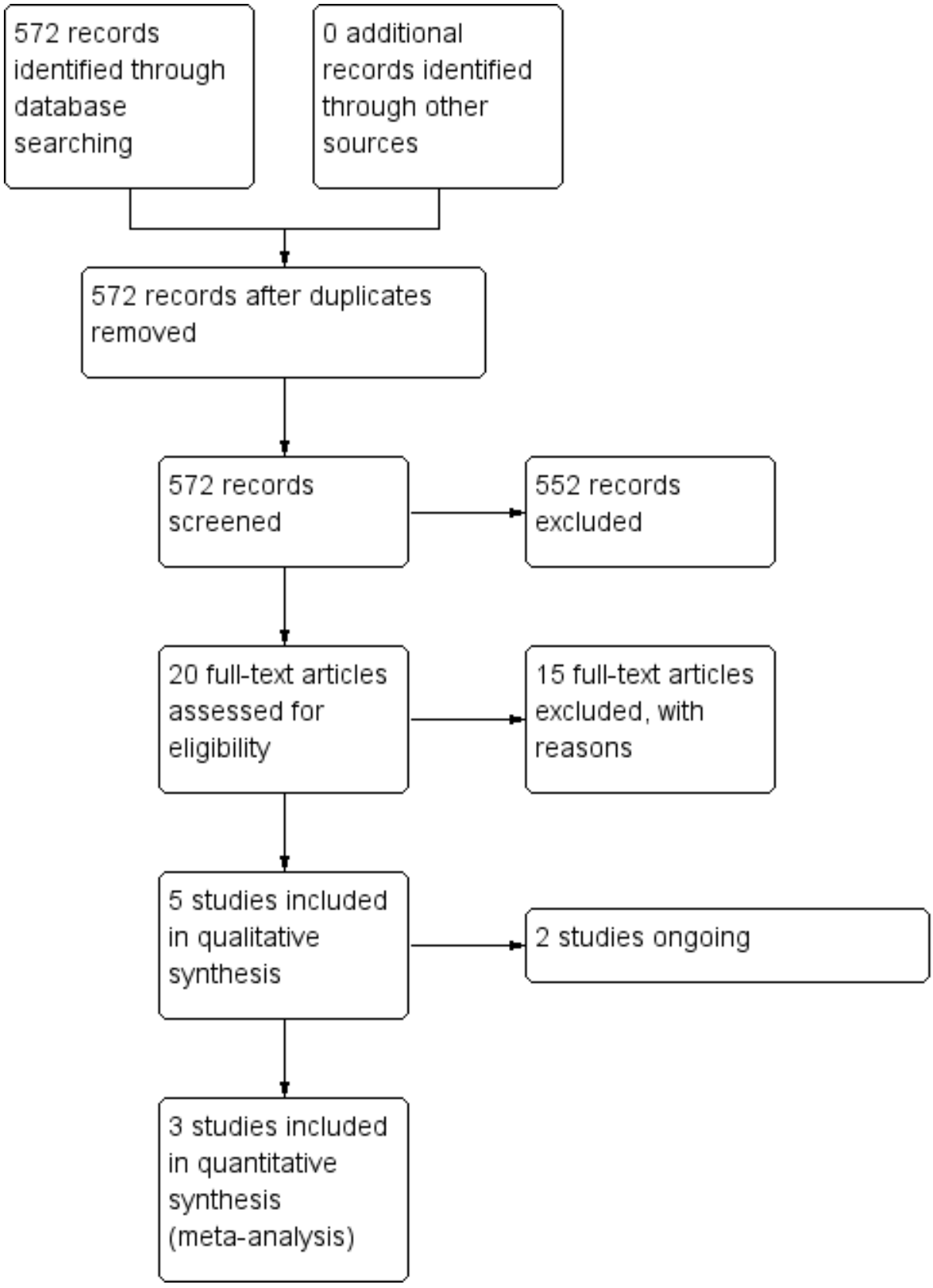
**Figure 1. Study flow diagram - 2011 update**





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## Included studies

The current review includes nine reports describing seven studies (Brown 1983; Campbell 1983; Chen 2009; Patterson 2003; Patterson 2006; Zhao 2007; Zheng 2006). This review now includes data on 483 randomised people from within these seven separate trials.

### *1. Methods*

All studies were stated to be randomised. Patterson 2003 and Patterson 2006 both stated that the assessors were blinded to the participant's treatment allocation, whilst Brown 1983, Campbell 1983, Chen 2009, Zhao 2007 and Zheng 2006 did not report if blinding was attempted. For further details, please see sections below on Allocation and Blinding.

### *2. Duration*

Most trials were undertaken for no longer than four months (Brown 1983 seven weeks, Campbell 1983, Chen 2009 and Patterson 2003 12 weeks, Zhao 2007 16 weeks, Zheng 2006 six weeks). The longest trial (Patterson 2006) lasted for 24 weeks.

### *3. Participants*

All participants were people with a chronic mental illness, mostly with schizophrenia and schizophrenia-like disorders. One of the studies randomised only men (Brown 1983) and the two Chinese studies randomised only women (Zhao 2007; Zheng 2006); the others included both sexes. The mean age for three studies was 32 to 38 years (Brown 1983; Zhao 2007; Zheng 2006) and for three studies the mean age was 45 to 50 years (Campbell 1983; Patterson 2003; Patterson 2006). The age of the participants was not stated in Chen 2009.

### *4. Setting*

Six studies used a hospital setting (Brown 1983; Chen 2009; Patterson 2003; Patterson 2006; Zhao 2007; Zheng 2006) and in Campbell 1983 the participants attended a day hospital.

### *5. Interventions*

In Brown 1983 and Campbell 1983 the life skills programme consisted of a mixture of interpersonal skills, grooming and personal hygiene, stress management, nutrition, finance, and time management skills. The comparison groups were 'traditional rehabilitation' involving recreation, art and occupational therapy. The intensity of input was four hours per day, five days a week for seven weeks (Brown 1983), or four weekly sessions of an hour each for 12 weeks (Campbell 1983). For Patterson's studies, both in 2003 and 2006, life skills were trained via the programme entitled "Functional Adaptation Training (FAST)". This programme composed of six areas of medication management skills, social skills, communication skills, organisation and planning skills, transportation skills and financial management skills. The control group received treatment as usual (Patterson 2003) or attention control condition which provided group support for participants (Patterson 2006). In Patterson 2003 the FAST was provided 120 minutes semi-weekly for 24 weeks, while in Patterson 2006 it was provided 120 minutes weekly for 24 weeks. In Chen 2009, the life skills training included: 1) independent living skills training, e.g. getting dressed, keeping good personal hygiene; 2) participation in recreational therapeutic activities, e.g. reading, watching TV, writing diary, attending music therapy etc; 3) other skills training, e.g. role-play, group shopping, going to parties etc to improve social skills; these three sets of training were offered once a week for an hour each time. In addition to these, psychiatrists and nurses offered psychoeducation therapy to patients once a week for half a day each time.The comparison group was given routine antipsychotic medication. In Zhao 2007, the life skills programme consisted of a mixture of life skills including dressing themselves, time keeping, helping them to get into a daily routine, encouraging them to participate in recreational activities and correcting their inappropriate behaviour. Patients with good treatment compliance were encouraged verbally and given material incentives; participants with poor compliance were criticized and given a restricted range of activity choices. The comparison group was given routine antipsychotic medication. In Zheng 2006, life skills training included three aspects: 1) daily living skills training, e.g. personal hygiene, getting dressed, eating meals on time (a token economy was applied to encourage good behaviour); 2) social skills training, role-play; 3) recreational activities with the aim of encouraging social participation and improve social interest. Activities included singing, dancing, painting and day trips. The comparison group was given routine care.

### *6. Outcomes scales*

#### 6.1 Mental state

i. Positive and Negative Syndromes Scale - PANSS (Kay 1986)
This scale is used for measuring symptom reduction of patients with schizophrenia. The 30-item PANSS was conceived as an operationalised, drug-sensitive instrument that provides balanced representation of positive and negative symptoms and gauges their relationship to one another and to global psychopathology. It thus constitutes four scales measuring positive and negative syndromes, their differential and general severity of illness. The name refers to the two types of symptoms in schizophrenia as defined by the American Psychiatric Association: positive symptoms, which refer to an excess or distortion of normal functions, and negative symptoms, which represent a diminution or loss of normal functions. High scores suggest greater psychopathology. Patterson 2003 and Patterson 2006 reported data from this scale.

- PANSS positive syndrome range from 7 to 48
- PANSS negative syndrome range from 7 to 48
- PANSS general psychopathology range from 16 to 96

ii. Scale for the Assessment of Negative Symptoms - SANS (Andreasen 1983)
This scale allows a global rating of the following negative symptoms: alogia (impoverished thinking), affective blunting, avolition-apathy, anhedonia-asociality, and attention impairment. Assessments are made on a six-point scale from zero (not at all) to five (severe). Higher scores indicate more symptoms.Chen 2009 and Zheng 2006 reported data from this scale.

iii. Hamilton Rating Scale for Depression - HAM-D (rated by therapist) (Hamilton 1967)
This instrument is designed to be used only with patients already diagnosed as suffering from affective disorder of a depressive type. It is used for quantifying the results of an interview, and its value depends entirely on the skill of the interviewer in eliciting the necessary information. The scale contains 17 variables measured on either a five-point or a three-point rating scale, the


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latter being used where quantification of the variable is either difficult or impossible. Among the variables are: depressed mood; suicide; work and loss of interest; retardation; agitation; gastro-intestinal symptoms; general somatic symptoms; hypochondriasis; loss of insight and loss of weight. It is useful to have two raters independently scoring a patient at the same interview. The scores of the patient are obtained by summing the scores of the two physicians. A score of 11 is generally regarded as indicative of a diagnosis of mild depression, 14 to 17 mild to moderate depression and >17 moderate to severe depression. Patterson 2003 and Patterson 2006 reported data from this scale.

iv. Zung Self-Rating Depression Scale - (self-rated) (Zung 1965)
The Zung Self-Rating Depression Scale is a 20-item self-rated scale that is widely used as a screening tool, covering affective, psychological and somatic symptoms associated with depression. The questionnaire takes approximately 10 minutes to complete and items are framed in terms of positive and negative statements. It can be effectively used in a variety of settings, including primary care, psychiatric clinics, drug trials and various research situations. Each item is scored on a Likert scale ranging from one to four. Most people with depression score between 50 and 69, while a score of 70 and above indicates severe depression. Brown 1983 reported data from this scale.

v. Profile of Moods State - POMS (self-rated) (McNair 1971)
This instrument was designed to measure mood states in psychiatric outpatients and as a method for assessing change in such people. It has been used in many drug evaluation studies. Mood reactions are to be reported for a specific period of time, such as the previous week. This helps distinguish mood states from enduring personality traits. It contains 65 items, takes about five minutes to complete and is designed for use with adults. Brown 1983 reported data from this scale.

vi. Future Outlook Inventory - FOI (Gunn 1970)
This self-administered test measures the future outlook of hospitalised psychiatric patients and is designed for use in psychiatric diagnosis, rehabilitation, and prediction of successful return to the community. It contains 57 items and is designed for use with adults. Brown 1983 reported data from this scale.

#### 6.2 General functioning/Life skills

i. UCSD Performance-based Skills Assessment - UPSA (Patterson 2001a)
This is the measure of everyday functioning for severely mentally ill adults. It requires participants to role-play a variety of complex situations including management of finances, social and communication skills, transportation, and household chores. The scores are given in each functional area, and the sum of scores from each domain is the total score. High scores indicate better functioning. Patterson 2006 reported data from this scale.

ii. Nurses' Observation Scale for Inpatient Evaluation –NOSIE (Honigfeld 1965)
This is a 30-item scale designed to assess the behaviour of patients on an inpatient unit. It is simple to administer, and may be used to assess patients that may be too ill to participate in more interactive rating scales. Chen 2009, Zhao 2007 and Zheng 2006 reported data on this scale.

iii. Scale of Social-skills for Psychiatric Inpatients – SSPI (Guo 1995)
This scale is a Chinese rating scale, commonly used for assessing response to antipsychotic treatment. Zheng 2006 reported data from this scale.

iv. Social Skills Performance Assessment - SSPA (Patterson 2001b)
This is the measure of social and communication skills of older patient with schizophrenia. It assesses through the use short role-play scenarios that simulate interactions between a neighbour and a landlord. For each role-play, participants are rated from one (low) to five (high) on a number of domains including interest, fluency, clarity, affect, and social appropriateness. An overall score is obtained by summing the scores from each of the domain assessed (range from 1 to 48). High scores indicate higher skills. Patterson 2006 reported data from this scale.

v. The Medication Management Abilities Assessment - MMAA (Patterson 2002)
This measure aims to assess the ability to independently manage the medication of participants. Participants are given mock medication bottles that are labelled with direction for use. Participants are then instructed to sort the pills and describe to the interviewer how and when they should take them throughout the day. Scoring will be given based on the accuracy of the participant's counting of (a) pill type, (b) number of times per day the prescribed dose is to be taken, (c) number of capsules taken each time, and (d) whether they are taken with or without food as directed. Each deviation from the prescribed regimen is scored as an error (total score = zero to 25). Higher scores indicate worse functioning. Patterson 2006 reported data from this scale.

#### 6.3 Quality of Life

i. Quality of Well-Being Scale - QWB (Anderson 1989)
The QWB scale was developed to evaluate health related quality of life. It comprises four scales that focus on the physical impact of an illness. The interview will take an average of 12 minutes to complete. It utilizes a six-day follow-back format. A single index score, range from zero to 1 is obtained. Higher scores indicate better health-related quality of well-being. Patterson 2003 reported data from this scale. Also, Patterson 2006 did evaluate QWB but used the full score, rather than the QWB index, that ranged from zero to 100.

ii. General Quality of Life Inventory - GQOLI-74 (Wang 1997)
The GQOLI-74 is composed of 74 items and is scored through four dimensions: physical, material, social and psychological well-being. Higher scores indicate better quality of life. Chen 2009 reported data from this scale.

### *2. Missing outcomes*

Brown 1983 did evaluate life skills but used an instrument that was in a developmental phase (Life Skills Inventory) and no subsequent information about this tool has been found. We therefore decided not to present those data (see 'Methods' section). In addition, the Hamilton Rating Scale for Depression was rated by a therapist so data are also not reported in this review (see 'Methods' section). Chen 2009 evaluated quality of life using the GQOLI-74 but did not provide overall scores, only the scores for each dimension. Zheng 2006 evaluated behaviour and mental state using the NOSIE scale and SANS scale respectively. However, we did not present those data as they did not provide overall scores for these outcomes, but divided by cluster.


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### Excluded studies

In the previous version of this review 40 studies were excluded. We excluded a further 13, bringing the total number excluded to 53. Of these, five studies were not randomised and three reports were review articles. The other 45 studies were randomised (43) or quasi-randomised (two). In each, the experimental groups were allocated to a programme that had some elements of life skills but also incorporated other training interventions, of which social skills were frequently used. One study (Duncombe 2004) did compare cooking skills lessons between two settings, both in the clinic and the patient's home. The results between the two settings were presented and indicated no significant difference. However, we felt that the authors should compare the change in skills in each setting with the control group rather than comparing skills score in each setting. Another study (Mosher 1978) compared life skills programmes with standard care but the experimental intervention took place in a community setting, whilst the standard care group were within a hospital setting. We felt that the allocation to hospital or community would confound any evaluation of life skills.

#### *Awaiting assessment*

No studies are awaiting assessment.

#### *Ongoing*

We found two ongoing studies.NCT00071591 compares Functional Adaptation Skills Training (FAST) with participation in a psychosocial support group for older people with schizophrenia, and in NCT00069433 intensive symptom management and social skills training is compared with group therapy for people with schizophrenia.

## Risk of bias in included studies

We prepared a 'Risk of bias' assessment for each trial. Our judgments regarding the overall risk of bias in individual studies are illustrated in Figure 2 and Figure 3. Overall, we felt the risk of bias in the included studies to be high.

**Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.**

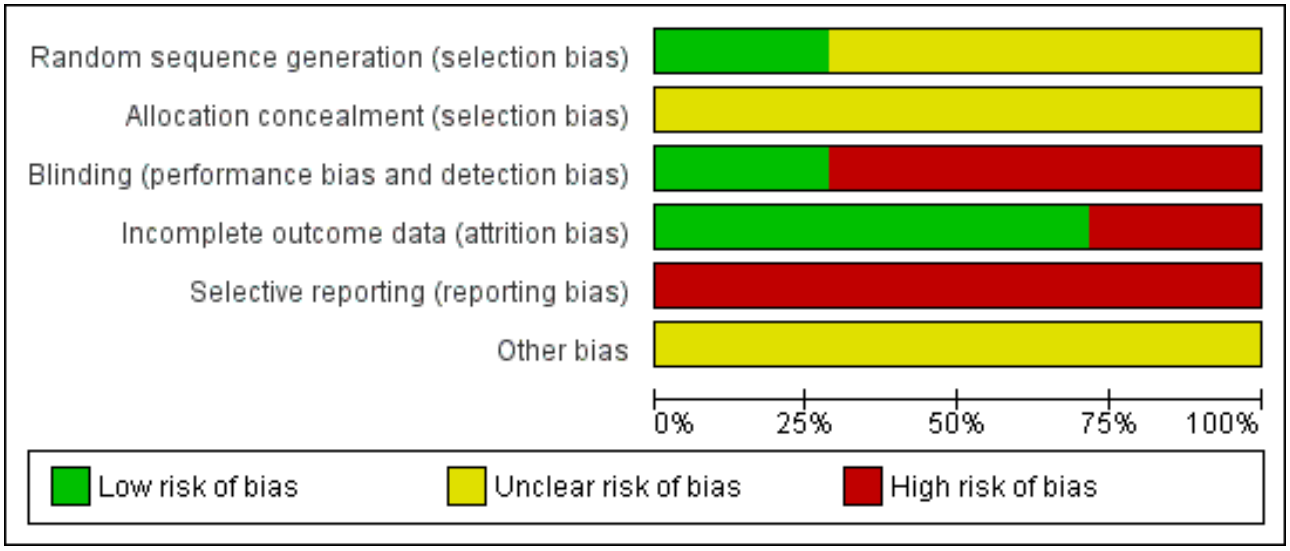



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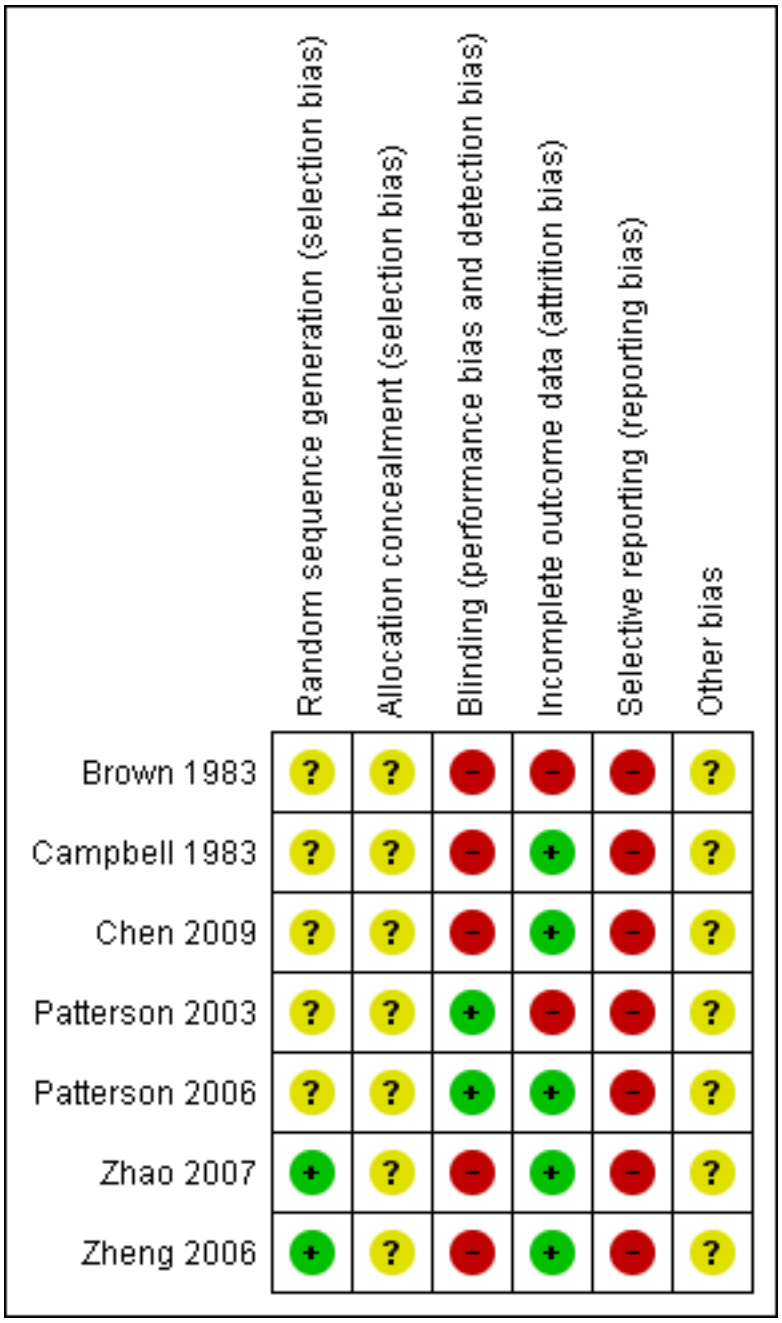
**Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.**




### Allocation

All studies were randomly assigned. However, four did not describe how allocation to intervention was undertaken. Patterson 2003 was a cluster randomised trial whereby clinics were randomised to either life skills programmes or standard care, and authors reported that outcomes were adjusted to take account of the clustering effect. Allocation concealment was not tested in any of the studies.

### Blinding

Five studies did not report that blinding was attempted. The other two (Patterson 2003; Patterson 2006), clearly stated that assessors were blinded to treatment condition of participants. None of the included trials tested adequacy of blindness of those rating outcomes.

### Incomplete outcome data

Incomplete data were addressed in four out of seven studies and were not addressed adequately in two trials.

### Selective reporting

No study was free from selective reporting.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### Other potential sources of bias

It was unclear in all of the trials whether they were free from other biases.

## Effects of interventions

See: **Summary of findings for the main comparison** Life skills programme compared to standard care for chronic mental illnesses; **Summary of findings 2** Life skills programme compared to attention-control for chronic mental illnesses

### 1. COMPARISON 1: LIFE SKILLS PROGRAMME versus STANDARD CARE

#### *1.1 Life skills*

##### 1.1.1 Life skills: No important change in specific skills

We found all outcomes by Campbell 1983 relating to acquisition of skills, household activity skills, kitchen skills, laundry skills and self-care were not significantly different between intervention groups. These are highly specific skills from a very small study (n = 10) and are presented in order to generate hypotheses (Analysis 1.1).

##### 1.1.2 Life skills: Various scale derived data

For NOSIE endpoint score (at 12 to 16 weeks), we found a significant difference in favour of the control group at endpoint (12 to 16 weeks) (n = 205, 2 RCTs, mean difference (MD) 16.77; 95% confidence interval (CI) 10.56 to 22.99). Zheng 2006 also provided data using the NOSIE scale; however, we could not pool the results, as the overall scores were not provided. The authors provided information on certain scale components, such as social functioning, social interest, personal hygiene, irritability, general mental state, with the results reported as significant when baseline was compared with endpoint. The UPSA endpoint score (at 24 weeks) was, however, not significant (Patterson 2003, n = 32, MD -1.10; 95% CI -7.82 to 5.62) (Analysis 1.2).

#### *1.2 Leaving the study early*

In Brown 1983, three people left the study early, two from the experimental group and one from the control group. Eight people dropped out in Patterson 2003, four from each group. There were no dropouts in Chen 2009, Zhao 2007 and Zheng 2006. Overall no significant differences were found between groups (n = 345, 5 RCTs, risk ratio (RR) 1.16; 95% CI 0.40 to 3.36) (Analysis 1.3).

#### *1.3 Mental state*

##### 1.3.1 Average endpoint scores

Patterson 2003 measured general and positive symptoms at 24 week using the PANSS scale. We found that life skills did not significantly improve the psychopathology of those with serious mental illness (n = 32, MD -0.80; 95% CI -4.38 to 2.78 for positive symptoms; n = 32, MD 0.00; 95% CI -3.12 to 3.12 for general psychopathology) (Analysis 1.5).

Patterson 2003 also measured negative symptoms at 24 week using the PANSS scale and, again, found no significant difference between treatment groups (n = 32, MD 1.90; 95% CI -1.75 to 5.55). In contrast, Chen 2009 measured negative symptoms at 12 weeks using the SANS scale and found a significant difference in favour of the treatment group (n = 120, MD -15.82; 95% CI -23.01 to -8.63). Zheng 2006 also provided data using the SANS scale; however we could not pool the results, as the overall scores were not provided. The authors reported on certain scale components, such as affective blunting, alogia, avolition, anhedonia, attentional disturbance, with results reported as significant when baseline was compared with endpoint.

Patterson 2003 reported endpoint data for depression using the HAM-D scale but data were skewed (wide SD) and are reported in other data tables (Analysis 1.4).

##### 1.3.2 Average change scores

For rating of depression Brown 1983 reported data from the Profile of Mood Scale which contained wide SDs and data were not significantly different between intervention groups (n = 25, MD -5.99; 95% CI -15.96 to 3.98). Brown 1983 also reported data from the Zung scale and again data contained wide SDs, and we found no significant difference between groups (n = 25, MD -7.17; 95% CI -18.65 to 4.31). (Analysis 1.6).

Brown 1983 also measured the prediction of a successful return to the community after life skills training (future outlook score). We found no significant differences between those who received training and those who did not (n = 25, MD -10.36; 95% CI -34.91 to 14.19) (Analysis 1.7).

#### *1.4 General functioning*

Zheng 2006 reported data from the SSPI scale and there was a significant difference favouring the treatment group (n = 80, MD -4.33; 95% CI -5.23 to -3.43) (Analysis 1.8).

#### *1.5 Quality of life*

We found data were not significantly different for quality of well-being after 24 weeks of life skills interventions compared with control (Patterson 2003, n = 32, MD -0.02; 95% CI -0.07 to 0.03) (Analysis 1.9). Chen 2009 also provided data on quality of life using the GQOLI-74 scale - but only for some components of the scale such as physical functioning, psychological functioning, social functioning and material life. Results were only reported as significant when baseline was compared with endpoint. We could not use these results as overall scores were not provided.

#### *1.6 Missing outcomes*

No study evaluated global state (relapse rate), adverse events, service outcomes, engagement with services, satisfaction with care or economic outcomes.

### 2. COMPARISON 2: LIFE SKILLS PROGRAMME versus ATTENTION CONTROL (support group)

There is only one study (Patterson 2006) in this comparison but it is one of the larger trials (n = 158).

#### *2.1 Life skills*

##### 2.1.1 Everyday functioning

Patterson 2006 measured the six areas of life skills e.g. management skills, social skills, communication skills, organisation and planning skills, transportation skills and financial management skills. We found no significant differences between those who attended skills training and those who received support group (n = 158, MD -2.50; 95% CI --8.94 to 3.94)) (Analysis 2.1).


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#### 2.1.2 Social skill performance

In this review we did not review programmes that specifically evaluated social skills training, except for the *life skills* programmes with related interpersonal skills. The FAST model is one such programme. We found no significant difference in social skills performance (Patterson 2006, n = 158, MD -0.90; 95% CI -3.39 to 1.59) between groups) (Analysis 2.1).

#### 2.1.2 Medication management ability

Medication management ability, although not a life skill by itself, has been considered part of the life functioning of those with chronic mental illness. Patterson 2006 reported data for this outcome. These data, however, were skewed and are reported in other data tables (Analysis 2.2).

### *2.2 Mental state*

#### 2.2.1 Change in psychopathology

In Patterson 2006, we found no significant difference for PANSS total score (n = 158, MD 2.70; 95% CI -4.78 to 10.18) (Analysis 2.3).

#### 2.2.2 Depression (HAM-D)

Patterson 2006 reported data from the HAM-D scale but data were too skewed and are reported in other data tables (Analysis 2.4).

### *2.3 Quality of life*

Life skills programmes did not significantly improve the quality of well-being for participants receiving life skills training (Patterson 2006, n = 158, MD 0.90; 95% CI -3.12 to 4.92) compared with the support group (Analysis 2.5).

### *2.4 Missing outcomes*

None of the studies evaluated global state (relapse rate), adverse events, service outcomes, engagement with services, satisfaction with care or economic outcomes.

## DISCUSSION

This current review is an update of a previous published version (Tungpunkom 2008).

### Summary of main results

The summary below reflects the outcomes chosen for the 'Summary of findings' table, and considered the main findings of this review that can support evidence-based decision making. For all outcomes included in Summary of findings for the main comparison and Summary of findings 2, the quality of evidence was found to be very low. We found no evidence to suggest that the life skills programme was superior to the control group for any outcome. However, only 483 people were randomised in these trials, and, due to the consequently wide CIs of the findings, there is the possibility that real effects have not been highlighted.

#### COMPARISON 1: LIFE SKILLS PROGRAMME versus STANDARD CARE

***1. Life skills: No important change in specific skills/global skills.***

Overall there were no significant differences between life skills programmes and standard care. For key simple tasks there were very few data indeed (Analysis 1.1) and this is clearly an area that is grossly under researched within trials. The useful Campbell 1983 trial only involved ten people. Average scores are available for many more people (total n > 100). As is common with scale-derived data, these are difficult to interpret from the clinical perspective. They are also contradictory. They do not give the impression that life skills are clearly effective - but the data from the two Chinese trials on the NOSIE scale is suggestive of some improvement.

***2. Leaving the study early***

Overall, remarkably few people left these studies. We found no significant differences in the number of participants leaving the study early between treatment groups. Three people left the study early in Brown 1983 without reasons given by the authors. Eight participants dropped out in Patterson 2003. There were no reported losses to follow-up in Chen 2009, Zhao 2007 and Zheng 2006. None of the studies used an intention-to-treat analysis. Low attrition probably refects the less confrontational nature of such studies - and the trialists - compared with more standard drug trials.

***3. Mental state***

All data were under-powered and none of the measures of mental state showed that life skills programmes were superior to standard care, with the exception of the data from China (Analysis 1.5). With the current level of evidence, however, it is not convincing that life skills programme have effects on mental state and, especially important, on negative symptoms - that have proved so intractable to other interventions.

***4. Quality of life***

Patterson 2003 tested the effect of life skills programmes on quality of well-being compared with standard care. No clear benefits were found. Chen 2009 also reported data on quality of life and found that there was indeed an improvement in all reported components of the scale used. These authors, however, did not report overall scores. These data were therefore not added to the analysis.

This positive finding from China is in keeping with the Chinese life skills and mental state data. This could mean that, within the Chinese healthcare system and culture, life skills programmes do have more of an effect than elsewhere - or that, as has been noted by other authors, the biases in many Chinese studies have not been adequately addressed (Wu 2009). Currently, we have erred on the side of caution and where there is one finding from China not replicated, or even refuted, by other data from elsewhere, we have tended to emphasise the data from elsewhere.

***5. Missing outcomes***

No studies should be undertaken that do not simply record relapse, adverse events, service outcomes, engagement with services, satisfaction with care or economic outcomes. These are not problematic to record from routine data.

#### COMPARISON 2: LIFE SKILLS PROGRAMME versus ATTENTION CONTROL (support group)

Patterson 2006 is a large study (for this area) involving over 200 participants. This trial compares life skills with those who received attention control i.e. support groups to encourage members to talk and solve their problems.


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### *2.1 Life skills*

Patterson 2006 measured no less than six areas of life skills and found no significant differences between those who attended skills training and those who received support group. The same trial investigated if the programme made a significant difference in social skills performance and medication management ability. There was no suggestion of an effect. There is always room for doubt - even Patterson 2006 is small and leaves much room for improvement, but even if this life skills programme does not erode those very life skills it targets, it does not seem to enhance them.

### *2.2 Mental state, quality of life and missing outcomes*

Mental state scores were static as were the quality of life measures. There is no evidence that life skills programmes effect any import domains. It does seem an omission, however, that this study did not simply record relapse rate, adverse events, service outcomes, engagement with services, satisfaction with care or attempt to estimate economic outcomes.

## Overall completeness and applicability of evidence

### 1. Completeness

The three additional Chinese studies (Chen 2009; Zhao 2007; Zheng 2006) stated that all the participants randomised completed the study and we assume this to be the case, but we cannot be completely sure given the scarcity of information in these reports. Also, we did not find any studies with data for a wide range of key outcomes (relapse, adverse events, service outcomes, engagement with services, satisfaction with care, economic outcomes). It is clear that the research in this area remains incomplete and limited.

### 2. Applicability

In two of the additional Chinese papers (Zhao 2007; Zheng 2006) all the participants were female, and in Brown 1983 all were male. It is possible that findings from these papers may not be applicable in all circumstances but we do not feel this to be a major source of concern.

All of the included studies reported the intervention techniques adequately. Two studies used life skills programmes (Brown 1983; Campbell 1983), while (Patterson 2003 and Patterson 2006) taught life skills plus related interpersonal skills. A few of the excluded studies could not be included because they taught life skills as part of social skills training (e.g. Glynn 2002). We felt that the authors focused more on social skills training, medication management and problem solving skills which was not the main purpose of this review (please see detail in Characteristics of excluded studies). All additional Chinese studies (Chen 2009; Zhao 2007; Zheng 2006) primarily had life skills as the intervention, although all three did also include aspects of social skills training. We continue to consider whether our selection criteria for this review were too restrictive. Life skills training is, however, a common feature of the long-term rehabilitation of people with serious mental illnesses. Although this type of training may be combined with other programmes such as social skills training, it is distinctive and, we feel, still worthy of evaluation in its own right. It is a relatively simple type of treatment, with great potential benefit for those who are so profoundly disabled making normal community life nearly impossible. We found many good studies that tried to test the effect of life skills but some did not clearly distinguish between those with social skills or problem solving skills. However, the included studies provide some data for therapists to develop more effective programmes and more well-designed studies to measure specific outcomes (see Implications for research).

Studies often used different assessment scales and we were unable to pool the divergent outcome data making the detection of potential treatment effects more remote.

## Quality of the evidence

Most studies addressed incomplete data adequately as they either used an intention-to-treat analysis (Patterson 2006) or they had no participants lost to follow-up. However, only two of the seven included studies described an adequate sequence generation and none described the methods used to conceal allocation. Two studies were said to be blinded, all selectively reported outcomes, and it was unclear how free they were of other biases. Brown 1983 and Campbell 1983 were very small trials with sample sizes of less than 30 participants, and both were of short duration. Patterson 2003 used a cluster designed randomised trial involving four centres with a study population of just 10 participants for each centre. The chance of finding real treatment effects from such small studies is unlikely. All the studies presented short-term data (the longest being 24 weeks). The quality of the current evidence, therefore, is very low (Figure 2; Figure 3).

## Potential biases in the review process

We have worked only with published reports. By doing this we may be perpetuating a reporting and publishing bias. Funnel plots are unreliable with so few trials.

This review follows from a previous Cochrane review (Tungpunkom 2008) and knowledge of this did influence this 2011 update. It is possible that we have failed to identify systematic biases in the way we have undertaken the reviews across time.

It would have been better to have original individual patient data and avoid some inevitable reporting biases.

## Agreements and disagreements with other studies or reviews

We do not know of any other relevant quantitative review in this topic but these updated findings largely concur with the previous review (Tungpunkom 2008).

# AUTHORS' CONCLUSIONS

## Implications for practice

Despite the addition of three studies to this review, the quality of the reporting in these studies is very low and they do not address any additional outcomes that were missing from the previous version of this review. The overall conclusions of this review therefore remain unchanged.

### 1. People with serious mental illness

Considering that there is severely limited evidence that life skills training programmes are of value to those with serious mental illnesses, their advocates would be well justified in calling for a randomised controlled trial in this area. Until such time as any evidence of benefit is available, it is questionable whether


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recipients of care should be put under pressure to attend such programmes.

**2. Clinicians**

Many healthcare professionals spend significant parts of their jobs training people with chronic mental health problems in the area of life skills. This review shows that there is no evidence indicating that such programmes are helpful or harmful to this vulnerable group. The healthcare profession is responsible for a situation where an almost unevaluated and possibly expensive treatment is provided for a vulnerable population.

**3. Managers/policy makers**

It is likely that short-sighted managers or policy makers would see life skills programmes as ripe for closure. Nevertheless, others may see this as an ideal opportunity for evaluation and give full support to those wishing to undertake such work.

## Implications for research

**1. General**

There is a need for programmes tailored to improve the quality of life of people with chronic mental illnesses. From the limited data available, life skills appears to provide no benefit for people with chronic mental health problems; however, the data for the outcomes reported in this review were under-powered and unlikely to detect a real treatment effect. If there are benefits to be gained from life skills then larger trials of adequate power are needed to determine its value for such people. Large randomised controlled trials are needed to investigate the effects of life skills programmes. We are well aware that undertaking such a trials needs painstaking planning and that our suggestions are just those of reviewers in this area. However, we have considered the relevant trials in some detail and have learnt from their strengths and weaknesses. An outline for a suggested design of study is reported in Table 1.

**2. Specific**

**2.1 Randomisation and blinding**

If readers are to be assured that selection bias has been eliminated then the process of randomisation should be clearly described. Blinding in this area is problematic if the assessor is also implementing the intervention, as would appear to be the case. We feel it would be possible to design a study with simple pragmatic and objective outcomes that could be recorded by those not so closely involved in the intervention under evaluation.

**2.2 Outcomes**

Scale data, when derived from validated scales, are difficult to interpret, but it is impossible to decipher with any confidence data produced by a non-validated scale. We would suggest that if a trial is to be of use, dichotomous data are most valuable to both the clinician and recipient of care. These data should relate to the desired life skills as well as mental state, satisfaction and costs. If scale data are to be used, the interpretation of the results would be enhanced if future trials made use of the same scales used in this review, which would enable us to pool the outcome data.

**2.3 Reporting of data**

Clear presentation of raw dichotomous data assists reviews such as this. If continuous data are to be used they should be presented with a mean, SD and the total numbers from which they were derived. Inexact P values are unhelpful.

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* Indicates the major publication for the study

## CHARACTERISTICS OF STUDIES

### Characteristics of included studies *[ordered by study ID]*

**Brown 1983**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: not blinded.<br>Duration: 7 weeks.<br>Setting: hospital.<br>Design: parallel.<br>Country: USA. |
| Participants | Diagnosis: schizophrenia (DSM-III).<br>N = 28.<br>Sex: M 28.<br>Age: mean 35 years.<br>History: chronic schizophrenics, 97% had more than four previous hospitalisations. |
| Interventions | 1. Interpersonal and instrumental skills group: (20 hrs/week) interpersonal communication skills, nutrition, health, finance, time management, utilization of community resource; groups < 9, leader participant ratio 1:4. (N = 14).<br><br>2. Standard Veterans Administration rehabilitation programme: (20 hrs/week) recreation, art, occupation therapy. (N = 14). |
| Outcomes | Leaving the study early.<br>Attitude/affective measures (FOI, POMS, SAS, Zung Self-Rating Depression Scale).<br><br>Unable to use - Coping with community living situations (LSI - unpublished scale).<br>Mood (HRSD - not rated independently). |
| Notes | Lost to follow-up: 10.7%.<br>Not "intention-to-treat" analysis. |


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**Brown 1983** *(Continued)*

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | "randomly assigned" - no further details. |
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias)<br>All outcomes | High risk | Not blinded. |
| Incomplete outcome data (attrition bias)<br>All outcomes | High risk | "Two patients dropped out of the life skills training and one patients dropped out of the control condition." No further informations given. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | Small sample size. Protocol not available. Source of support not reported. |

**Campbell 1983**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: not stated.<br>Duration: 12 weeks.<br>Setting: day hospital.<br>Design: parallel.<br>Country: UK. |
| Participants | Diagnosis: schizophrenia (Feighner).<br>N = 10.<br>Sex: M 6, F 4.<br>Age: mean ˜47 years.<br>History: "chronic", mean length ill ˜ 22 years. |
| Interventions | 1. Treatment programme: (4 one-hour sessions/week) a self-care, shopping, laundry, household & kitchen duties programme. (N = 6).<br><br>2. Standard day hospital programme*. (N = 4). |
| Outcomes | Kitchen skills.<br>Self-care skills.<br>Laundry skills.<br>Household skills.<br>All assessed by the Royal Edinburgh Occupational Therapy Assessment Form. |
| Notes | Lost to follow-up: 0%<br>*No details of the standard day hospital programme given. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|


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**Campbell 1983** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | "randomly assigned" - no further details. |
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias)<br>All outcomes | High risk | Not blinded. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | All included patients completed the trial. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | Very small sample size. Protocol not available. Source of support not reported. |

**Chen 2009**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: not stated.<br>Duration: 12 weeks.<br>Setting: inpatient.<br>Design: parallel.<br>Country: China. |
| Participants | Diagnosis: schizophrenia (CCMD-3).<br>N = 120.<br>Sex: not stated.<br>Age: not stated.<br>History: chronic schizophrenia. |
| Interventions | 1. Life skills training + routine antipsychotic medication: Life skills training included: 1) independent living skills training, e.g. getting dressed, keep good personal hygiene; 2) participation in recreational therapeutic activities, e.g. reading, watching TV, writing diary, attending music therapy etc; 3) other skills training, e.g. role-play, group shopping, go to parties etc to improve social skills; these 3 sets of training offered once a week for an hour each time. In addition to these, psychiatrists and nurses offer psychoeducation therapy to patients once a week for half a day each time. (N = 60).<br><br>2. Routine antipsychotic medication. (N = 60). |
| Outcomes | Mental state: SANS endpoint scale score.<br>Behaviour: NOSIE endpoint scale score.<br>Quality of life: GQOLI-74 sub-scale score. |
| Notes | |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | "randomised" - no further details. |


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**Chen 2009** *(Continued)*

| | | |
|---|---|---|
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias) All outcomes | High risk | Not stated. |
| Incomplete outcome data (attrition bias) All outcomes | Low risk | No incomplete outcome data. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | No sample size calculation. Protocol not available. Source of support not reported. |

**Patterson 2003**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: single blind.<br>Duration: 12 weeks and follow-up 12 weeks.<br>Setting: board and care facility in community.<br>Design: Parallel.<br>Country: USA. |
| Participants | Diagnosis: schizophrenia and schizoaffective disorder (DSM-IV).<br>N = 40*<br>Sex: male and female.<br>Age: at least 40 (mean age ~ 45 years).<br>History: long standing psychotic disorders. |
| Interventions | 1. FAST; (120 minutes 24 semi-weekly) intervention composed of 6 areas of everyday functioning: i) medication management, ii) social skills, iii) communication skills, iv) organisation and planning, v) transportation, and vi) financial management. (N = 20).<br><br>2. Treatment as usual. (N = 20). |
| Outcomes | Functioning. UPSA, SSPA, MMAA.<br>Mental state: PANSS, HAM-D, QWB. |
| Notes | Lost to follow-up: 20%.<br>No intention-to-treat analysis.<br>*8 dropped out and were excluded from analysis. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | "randomly assigned" - four out of eight facilities were randomly chosen into study. Ten patients were recruited from each site and two facilities were randomly assigned to either experimental or control group - no further details. |
| Allocation concealment (selection bias) | Unclear risk | No details provided. |


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**Patterson 2003** *(Continued)*

| | | |
|---|---|---|
| Blinding (performance bias and detection bias) All outcomes | Low risk | Assessors were blinded to participants' treatment condition. |
| Incomplete outcome data (attrition bias) All outcomes | High risk | "Eight of the 40 participants dropped out after the baseline assessment and were excluded from further analysis". No further information given. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | Small sample size. Protocol not available. Support for this work was provided, in part, by the National Institute of Mental Health (NIMH) grants, and, in part, by the VISN-22 Mental Illness Research Education and Clinical Center (MIRECC) of the U.S. Department of Veterans Affairs. |

**Patterson 2006**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: single blind.<br>Duration: 24 weeks.<br>Setting: board and care facility in community.<br>Design: parallel.<br>Country: USA. |
| Participants | Diagnosis: schizophrenia and schizoaffective disorder (DSM-IV).<br>N = 240*.<br>Sex: M 156 and F 84.<br>Age: at least 40 (mean age ~ 50 years).<br>History: no involvement in other psychosocial study or drug research prior or at follow-up period. |
| Interventions | 1. FAST: (weekly 120 min sessions provided for 24 weeks) composed of 6 areas of everyday functioning: i) medication management, ii) social skills, iii) communication skills, iv) organisation and planning, v) transportation, and vi) financial management; (N = 124).<br><br>2. Attention control condition: (120 min/weekly for 24 weeks) a support group session that provided a supportive environment for addressing personal problems. The first hour was provided a chance for freely discussed issue important to the patients and therapist then identified common themes; second hour therapist facilitated discussion around theme designed for that session, solution was emerged by group members discussion. (N = 116). |
| Outcomes | Functioning. UPSA, SSPA, MMAA.<br>Mental state: PANSS, HAM-D, QWB. |
| Notes | Lost to follow-up: 34.2%.<br>Intention-to-treat analysis<br>* 240 were included in random assignment to study groups: 124 for experimental group; 116 for control group; 18 were withdrew from the experiment group due to moved from B & C (n = 8), hospitalised/medical (n = 3), schedule conflict (n = 2), lost contact (n = 2) and refused intervention (n = 3), therefore only 106 received intervention but 7 lost to follow-up. 99 were eligible to analyse but only 82 were completer.<br>14 were excluded from the control group due to moved from B & C (n = 4), hospitalised/medical (n = 3), schedule conflict (n = 1), lost contact (n = 2),refused intervention (n = 2), jailed (n = 1),and lack of transportation(n = 1), therefore only 102 received regular intervention but 6 were lost to follow-up. 96 were eligible for analysis but only 76 were completer. |


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**Patterson 2006** *(Continued)*

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Random sequence generation (selection bias) | Unclear risk | "randomised" - no further details. |
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias)<br>All outcomes | Low risk | Assessors were blinded to participants' treatment condition. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | Intention-to-treat consisted of participants who attended at least one session of their assigned intervention and completed both a baseline and follow-up assessment. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | No sample size calculation. Protocol not available. Source of support not reported. |

**Zhao 2007**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: not stated.<br>Duration: 16 weeks.<br>Setting: inpatients, Taiyuan Psychiatric Hospital, Shanxi Province.<br>Design: parallel.<br>Country: China. |
| Participants | Diagnosis: decline phase schizophrenia (CCMD-3).<br>N = 85.<br>Sex: F 85.<br>Age: average ˜ 38.5 years.<br>History: average length of illness ˜ 12 years. |
| Interventions | 1. Life skills training + routine antipsychotic medication: (4 times/week) training includes 3 stages: stage 1 - train the participants to keep good personal hygiene; stage 2 - train them to keep time and help them to get into a daily routine, encourage them to participate in recreational activities and correct their inappropriate behavior; stage 3 - day trips and some physical activities, such as gardening, cleaning, grocery shopping. Participants with good treatment compliance were encouraged verbally and given material incentives, participants with poor compliance were criticized and given restricted range of activity choices. (N = 42).<br><br>2. Routine antipsychotic medication. (N = 43). |
| Outcomes | Behaviour: NOSIE endpoint scale score. |
| Notes | Loss to follow-up: 0%. |

***Risk of bias***

| Bias | Authors' judgement | Support for judgement |
|---|---|---|


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**Zhao 2007** *(Continued)*

| | | |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Randomisation was done with random number tables. |
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias)<br>All outcomes | High risk | Not stated. |
| Incomplete outcome data (attrition bias)<br>All outcomes | Low risk | No incomplete outcome data. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | No sample size calculation. Protocol not available. Source of support not reported. |

**Zheng 2006**

| | |
|---|---|
| Methods | Allocation: randomised.<br>Blindness: not stated.<br>Duration: 6 weeks.<br>Setting: inpatients, Teaching Hospital of Xinxiang Medical College, Henan Province.<br>Design: parallel.<br>Country: China. |
| Participants | Diagnosis: schizophrenia (CCMD-3).<br>N = 80.<br>Sex: F 80.<br>Age: average ˜ 32 years.<br>History: average length of illness ˜ 6.8 years. |
| Interventions | 1. Life skills training + routine care: training include 3 aspects: 1) daily living skills training, e.g. personal hygiene, getting dressed, eating meal on time (token economy was applied to encourage good behavior); 2) social skills training, role-play; 3) recreational activities with the aim of encourage social participation and improve social interest. Activities include singing, dancing, painting, day trips etc. (N = 40).<br><br>2. Routine care only. (N = 40). |
| Outcomes | Global state: SSPI endpoint scale scores.<br>Mental state: SANS endpoint sub-scale scores.<br>Behaviour: NOSIE endpoint sub-scale score. |
| Notes | Loss to follow-up: 0%. |

***Risk of bias***

| **Bias** | **Authors' judgement** | **Support for judgement** |
|---|---|---|
| Random sequence generation (selection bias) | Low risk | Randomisation was done with random number tables. |


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**Zheng 2006** *(Continued)*

| | | |
|---|---|---|
| Allocation concealment (selection bias) | Unclear risk | No details provided. |
| Blinding (performance bias and detection bias) All outcomes | High risk | Not stated. |
| Incomplete outcome data (attrition bias) All outcomes | Low risk | No incomplete outcome data. |
| Selective reporting (reporting bias) | High risk | Not all expected outcomes reported. |
| Other bias | Unclear risk | No sample size calculation. Protocol not available. Source of support not reported. |

**General**
CCMD - Chinese Classification of Mental Disorders
DSM-IV- Diagnostic Statistical Manual-Version 4.
DSM-III - Diagnostic Statistical Manual - version 3.
FAST - Functional Adaptation Training
VA - Veterans Administration
**Scales**
FOI - Future Outlook inventory
GQOLI - General Quality of Life Inventory
HAM-D - Hamilton Rating Scale for Depression
HRSD - Hamilton Rating Scale for Depression
LSI - Life Skills Inventory
NOSIE -Nurses' Observation Scale for Inpatient Evaluation
POMS - Profile of Moods Scale
SAS - Social Anxiety Scale
PANSS - Positive and Negative Symptom Scale
QWB - Quality of Well-being scale
UPSA - The UCSD Performance-based Skills Assessment
SANS - Scale for the Assessment of Negative Symptoms
SSPA - Social Skills Performance Assessment
SSPI - Scale of Social-skills for Psychiatric InpatientsI
MMAA - Medication Management Abilities Assessment

## Characteristics of excluded studies *[ordered by study ID]*

| Study | Reason for exclusion |
|---|---|
| Armstrong 1991 | Allocation: "randomly assigned", groups unbalanced, only 'completer' data reported, original numbers unclear.<br>Participants: people with chronic mental illness.<br>Interventions: life skills programme versus supportive psychotherapeutic milieu therapy. Dr Armstrong contacted, data destroyed and denominators unknown. |
| Burns 1993 | Allocation: randomised.<br>Participants: "general psychiatric patients".<br>Interventions: home-based care versus admission to hospital, not life skills programme. |
| Chen 2003 | Allocation: randomised.<br>Participants: people with schizophrenia. |


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| Study | Reason for exclusion |
|---|---|
| | Intervention: skills training, but not living skills training, including entertainment activities, e.g. singing, dancing, ball games etc; psychoeducation; rehabilitation activities, e.g. cleaning, cutting grass, planting vegetables etc. |
| Dai 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: psychoeducation versus routine drug treatment. |
| Dobson 1995 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: social skills training versus social milieu therapy, not life skills programme. |
| Drake 1994 | Allocation: not randomised, comparison of two day-centre programmes in different geographical areas. |
| Du 2005 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: psychoeducation not life skills; included 3 stages i) community independent living skills training (more likely psychoeducation: training on basic knowledge of schizophrenia, related stress to community re-entry, social skills and how to cope with stress; ii) medication management, trained to recognise the importance of taking medication and the side effects; iii) self-monitoring-early warning sign recognition, how to cope with chronic symptoms. |
| Duncombe 2004 | Allocation: randomised.<br>Participants: people with non paranoid schizophrenia and schizoaffective disorders.<br>Intervention: 4 cooking lessons provided at clinic and patients' home; author compared the results of cooking skills between two settings but no control group data presented. |
| Elkis 2008 | Trial Register. Social skills training. |
| Feifei 1994 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: life skills training and a token economy. |
| Garety 1994 | Allocation: "non-random allocation". |
| Glynn 1999 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: social skills. |
| Glynn 2002 | Allocation: randomised.<br>Participants: people with schizophrenia and schizoaffective disorder.<br>Interventions: behaviourally-orientated clinic social skills training with in vivo amplified skills training; part of the programme reported successful living skills module but did not explain clearly how it focused on medication management, social skills and problem solving rather than life skills per se. |
| Goldberg 1994 | Allocation: not randomised, review. |
| Hayes 1991 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: activity (constructional skills) therapy versus social skills training, not life skills programme, no standard care group. |
| Hoult 1983 | Allocation: randomised.<br>Participants: people with schizophrenia. |


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| Study | Reason for exclusion |
|---|---|
| | Interventions: community-orientated care versus hospital-orientated care - hospital-diversion programme, not life skills programme. |
| Ikebuchi 1995 | Allocation: not randomised, case series. |
| Jerrell 1995 | Allocation: randomised.<br>Participants: people with severe mental illness and substance abuse.<br>Interventions: behavioural skills training versus case management versus 12-step recovery, not life skills programme. |
| Jin 1994 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: standard care versus open door policy, not life skills programme. |
| Johnson 1965 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: community residential treatment programme (not life skills programme) versus standard community mental health centre inpatient programme. |
| Lafave 1996 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: wide range of interventions offered including life skills. |
| Li 1994 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: life skills with positive reinforcement; the reward system effected to skills rather than the programme itself.<br>Outcomes: no usable data (results cannot be separated). |
| Li 2002 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: community-based rehabilitation intervention, not living skills training. |
| Li 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: social skills training versus routine antipsychotic treatment. |
| Liberman 2009 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: social skills training. |
| Luo 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: observed intervention in this study is nursing intervention, including 1) cognitive training ,e.g. music, painting, dancing and art appreciation; 2) independent living skills training; 3) social skills training, 4) other occupational training. |
| Ma 2001 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: occupational rehabilitation, not life skills. |
| Ma 2003 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: including 3 stages: i) community independent living skills training, ii) medication management, iii) self-monitoring and early warning sign recognition; results cannot be separated (except, there is DAS sub-scale score on social functioning, family functioning, employment, independent living). |


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| Study | Reason for exclusion |
|---|---|
| May 1985 | Allocation: randomised.<br>Participants: people with chronic mental illness.<br>Intervention: not everyday life skills training but rather focused more on social skills; included 3 areas: i) interpersonal communication; ii) purpose in life problem solving; and iii) physical fitness. |
| Mosher 1978 | Allocation: by availability of bed in experimental or control units, quasi-randomised.<br>Participants: people with schizophrenia.<br>Interventions: community residential treatment (including life skills), 1:1 staff:client ratio versus standard inpatient care, life skills programme not randomised within the same treatment setting. |
| Muijen 1992 | Allocation: randomised.<br>Participants: people with serious mental illnesses.<br>Interventions: home-based daily living programme versus outpatient care, the daily living programme involved life skills support but other interventions set in a comprehensive community-support package. |
| Ng 2006 | Allocation: randomised.<br>Participants: people with serious mental illnesses.<br>Interventions: social skills training. |
| Nienhuis 1994 | Allocation: randomised.<br>Participants: mixture of diagnoses in need of admission.<br>Interventions: day hospital admission diversion programme versus standard admission, not life skills programme. |
| Otero 1993 | Allocation: not randomised, review. |
| Paul 1977 | Allocation: randomised.<br>Participants: people with serious mental illnesses.<br>Intervention: milieu therapy versus social learning therapy versus standard care, not life skills programme. |
| Penn 1996 | Allocation: not randomised, review. |
| Ru 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: life skills training + routine care versus routine care alone. Intervention including 1) treat the patients with respect and protect their dignity; 2) token economy on good behaviour; 3) psychological therapy 3 times a week. |
| Schepp 1999 | Allocation: randomised.<br>Participants: adolescents aged 15 to 19 years with schizophrenia. |
| Scott 1995 | Allocation: not randomised, review. |
| Sellwood 1995 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: wide range of interventions, not specifically life skills. |
| Stein 1975 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: wide range of interventions, including life skills. |
| Tang 2007 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: experimental intervention is social skills training, including independent living skills training; 2) medication self-management training; 3) symptom self-monitoring training. |


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| Study | Reason for exclusion |
|---|---|
| Tao 2002 | Allocation: quasi randomisation (according to hospital admission number).<br>Participants: people with schizophrenia.<br>Intervention: including 4 components: 1) +2) independent living skills (personal hygiene, cooking, washing etc); 3) entertainment training, e.g. singing contest, broadcast exercise etc; 4) returning to society training, patients were allowed to go home alone for a day over the weekend, or allowed to go shopping for a day. Outcomes: no usable data (results cannot be separated). |
| Wang 2002 | Allocation: randomised (no further detail given)<br>Participants: chronic schizophrenia patients<br>Intervention: independent living skills training through demonstration and token economy method. The results cannot be separated between the skills training and the reward effect. |
| Wang 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: behavioural intervention versus routine drug treatment. |
| Wang 2008a | Allocation: randomised.Participants: people with schizophrenia.Intervention: rehabilitation therapy versus care as usual. Rehabilitation including - 1) psychoeducation about the illness; 2)independent living skills training; 3) token economy on good behaviour; 4) participation in social activities. |
| Weng 2002 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Intervention: rehabilitation training not living skills training, including social skills training, employment skills training and token economy. |
| Whetstone 1985 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: social dramatics emphasising social skills versus standard care, non-social life skills functioning not investigated. |
| Wiersma 1991 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: day hospital versus standard admission, hospital diversion programme, not life skills programme. |
| Xu 2008 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: intervention including 4 major components, 1) medication self-management training; 2) independent living skills training; 3) social skills training; 4) occupational skills training. |
| You 2005 | Allocation: randomised.<br>Participants: people with schizophrenia.<br>Interventions: rehabilitation including elements of i) independent living skills training, e.g. washing, cooking, gardening, personal hygiene, ii) 30 minutes exercise, iii) watch news and comedy on TV, iv) learn a new song every week, v) group games and story telling section, vi) football games, and vii) social skills training.<br>Outcomes: no usable data (results cannot be separated). |
| Zhang 2001 | Allocation: not stated.<br>Participants: people with schizophrenia.<br>Intervention: 4 components: 1) independent living skills training (washing, dressing, personal hygiene etc); 2) social skills training (communication skills); 3) psychoeducation 4) family intervention.<br>Outcomes: no usable data (results cannot be separated). |
| Zhang 2004 | Allocation: randomised.<br>Participants: people with schizophrenia. |


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| Study | Reason for exclusion |
|---|---|
| | Intervention: 3 components: 1) independent living skills trading (its in fact more like psychoeducation, involving the education of schizophrenia as an illness, it's symptoms and the significance and importance of independent living skill training, but no specific training was stated); 2) medication management; 3) self-monitoring of symptoms and relapse signs.<br>Outcomes: no usable data (results cannot be separated). |

## Characteristics of ongoing studies *[ordered by study ID]*

### NCT00069433

| | |
|---|---|
| Trial name or title | Skills Training for Schizophrenia: Enhancing Outcomes. |
| Methods | |
| Participants | People with schizophrenia. |
| Interventions | 1. Intensive symptom management and social skills training.<br>2. Group therapy. |
| Outcomes | Treatment outcomes. |
| Starting date | |
| Contact information | |
| Notes | Participants taking stable doses of risperidone, olanzapine, or quetiapine.<br>A verbal memory test will be used to stratify the randomisation procedure and to control for neurocognitive functioning. |

### NCT00071591

| | |
|---|---|
| Trial name or title | Functional Skills Training for Late Life Schizophrenia. |
| Methods | Randomised control trial. |
| Participants | Older people with schizophrenia. |
| Interventions | 1. Functional Adaptation Skills Training (FAST).<br>2. Participation in a psychosocial support group. |
| Outcomes | Patients will be assessed at 6, 12, and 18 months after the study start. Assessments include clinical and functional measures. |
| Starting date | July 2001. |
| Contact information | |
| Notes | |


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## DATA AND ANALYSES

### Comparison 1. LIFE SKILLS PROGRAMME versus STANDARD CARE

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 1 Life skills: 1. No important change in specific skills | 1 | | Risk Ratio (M-H, Random, 95% CI) | Subtotals only |
| 1.1 household activity skills | 1 | 10 | Risk Ratio (M-H, Random, 95% CI) | 0.24 [0.01, 4.72] |
| 1.2 kitchen skills | 1 | 10 | Risk Ratio (M-H, Random, 95% CI) | 0.0 [0.0, 0.0] |
| 1.3 laundry skills | 1 | 10 | Risk Ratio (M-H, Random, 95% CI) | 0.14 [0.01, 2.38] |
| 1.4 self-care skills | 1 | 10 | Risk Ratio (M-H, Random, 95% CI) | 1.0 [0.28, 3.54] |
| 2 Life skills: 2. Average score (Various scales, endpoint, high score = better) | 3 | | Mean Difference (IV, Random, 95% CI) | Subtotals only |
| 2.1 NOSIE - at 12-16 weeks | 2 | 205 | Mean Difference (IV, Random, 95% CI) | 16.77 [10.56, 22.99] |
| 2.2 UPSA - at 24 weeks | 1 | 32 | Mean Difference (IV, Random, 95% CI) | -1.10 [-7.82, 5.62] |
| 3 Leaving the study early | 5 | 345 | Risk Ratio (M-H, Random, 95% CI) | 1.16 [0.40, 3.36] |
| 4 Mental state: 1b. Average endpoint score - at 24 weeks (HAM-D, skewed data) | | | Other data | No numeric data |
| 5 Mental state: 1a. Average endpoint scores (various scales, high score = worse) | 2 | | Mean Difference (IV, Random, 95% CI) | Subtotals only |
| 5.1 general pathology - at 24 weeks (PANSS general psychopathology) | 1 | 32 | Mean Difference (IV, Random, 95% CI) | 0.0 [-3.12, 3.12] |
| 5.2 positive syndrome - at 24 weeks (PANSS positive) | 1 | 32 | Mean Difference (IV, Random, 95% CI) | -0.80 [-4.38, 2.78] |
| 5.3 negative symptoms - 12-24 weeks (PANSS negative) | 1 | 32 | Mean Difference (IV, Random, 95% CI) | 1.90 [-1.75, 5.55] |
| 5.4 negative symptoms - 12-24 weeks (SANS) | 1 | 120 | Mean Difference (IV, Random, 95% CI) | -15.82 [-23.01, -8.63] |
| 6 Mental state: 2a. Average change scores - depression (various scales, high score = poor) | 1 | | Mean Difference (IV, Random, 95% CI) | Subtotals only |


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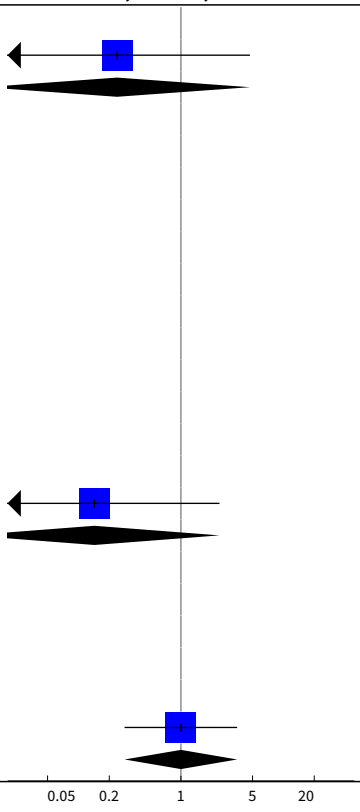
| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 6.1 POMS (depression subscales) | 1 | 25 | Mean Difference (IV, Random, 95% CI) | -5.99 [-15.96, 3.98] |
| 6.2 Zung | 1 | 25 | Mean Difference (IV, Random, 95% CI) | -7.17 [-18.65, 4.31] |
| 7 Mental state: 2b. Average change scores - future outlook (high score = better) | 1 | | Mean Difference (IV, Random, 95% CI) | Subtotals only |
| 7.1 FOI | 1 | 25 | Mean Difference (IV, Random, 95% CI) | -10.36 [-34.91, 14.19] |
| 8 General functioning: Average endpoint score - at 6 weeks (SSPI, high score = worse) | 1 | 80 | Mean Difference (IV, Fixed, 95% CI) | -4.33 [-5.23, -3.43] |
| 9 Quality of life: Average endpoint score - at 24 weeks (QWB, high score = better) | 1 | 32 | Mean Difference (IV, Random, 95% CI) | -0.02 [-0.07, 0.03] |

**Analysis 1.1. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 1 Life skills: 1. No important change in specific skills.**

| Study or subgroup | Treatment n/N | Control n/N | Risk Ratio M-H, Random, 95% CI | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|
| **1.1.1 household activity skills** | | | | | |
| Campbell 1983 | 0/6 | 1/4 | | 100% | 0.24[0.01,4.72] |
| **Subtotal (95% CI)** | **6** | **4** | | **100%** | **0.24[0.01,4.72]** |
| Total events: 0 (Treatment), 1 (Control) | | | | | |
| Heterogeneity: Not applicable | | | | | |
| Test for overall effect: Z=0.94(P=0.35) | | | | | |
| **1.1.2 kitchen skills** | | | | | |
| Campbell 1983 | 0/6 | 0/4 | | | Not estimable |
| **Subtotal (95% CI)** | **6** | **4** | | | **Not estimable** |
| Total events: 0 (Treatment), 0 (Control) | | | | | |
| Heterogeneity: Not applicable | | | | | |
| Test for overall effect: Not applicable | | | | | |
| **1.1.3 laundry skills** | | | | | |
| Campbell 1983 | 0/6 | 2/4 | | 100% | 0.14[0.01,2.38] |
| **Subtotal (95% CI)** | **6** | **4** | | **100%** | **0.14[0.01,2.38]** |
| Total events: 0 (Treatment), 2 (Control) | | | | | |
| Heterogeneity: Not applicable | | | | | |
| Test for overall effect: Z=1.36(P=0.17) | | | | | |
| **1.1.4 self-care skills** | | | | | |
| Campbell 1983 | 3/6 | 2/4 | | 100% | 1[0.28,3.54] |
| **Subtotal (95% CI)** | **6** | **4** | | **100%** | **1[0.28,3.54]** |





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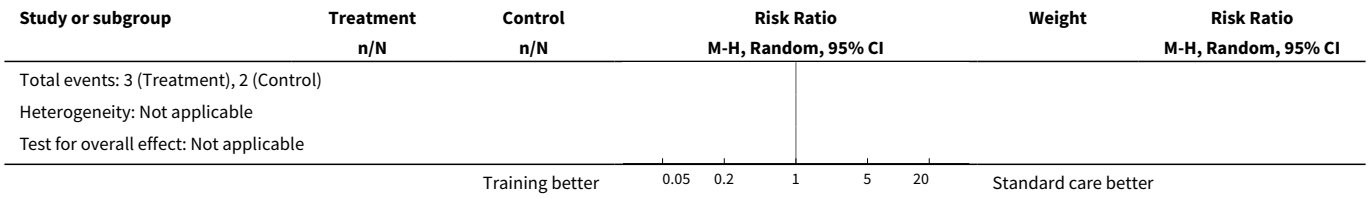
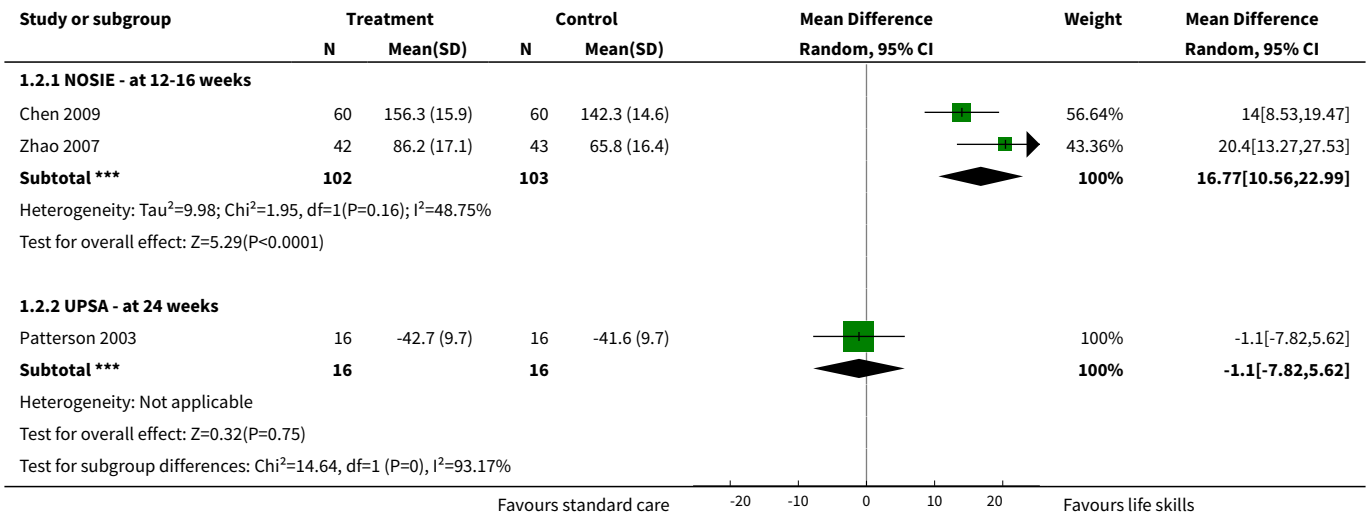
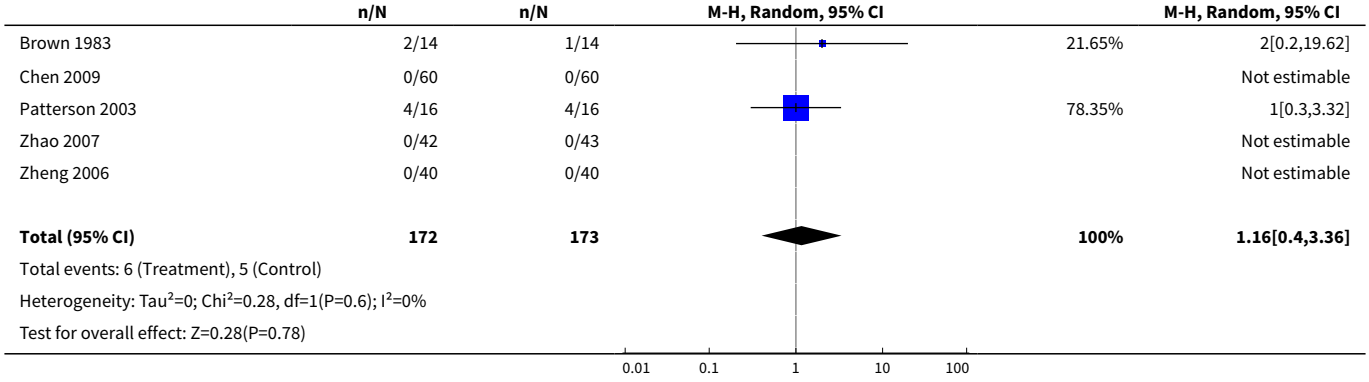



## Analysis 1.2. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 2 Life skills: 2. Average score (Various scales, endpoint, high score = better).




## Analysis 1.3. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 3 Leaving the study early.





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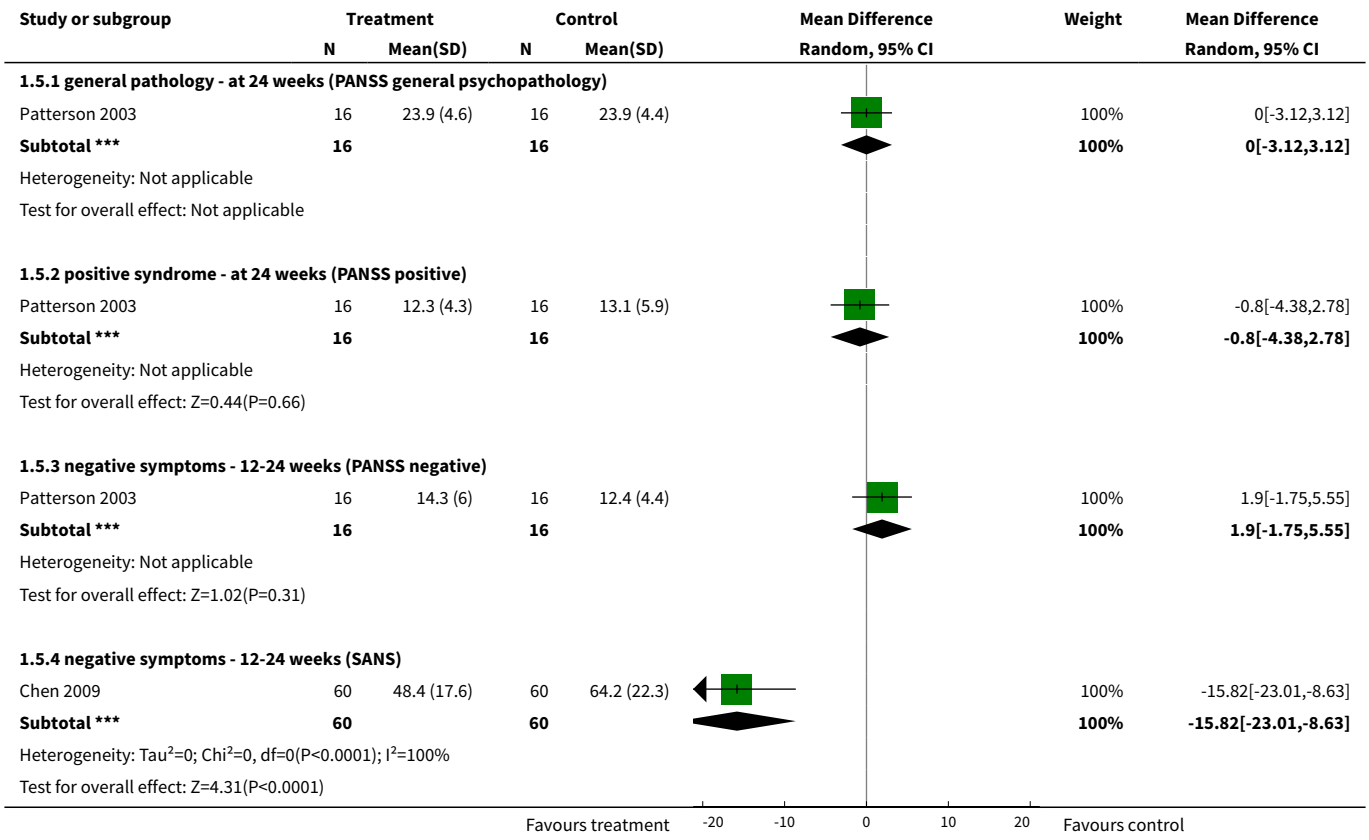
## Analysis 1.4. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 4 Mental state: 1b. Average endpoint score - at 24 weeks (HAM-D, skewed data).

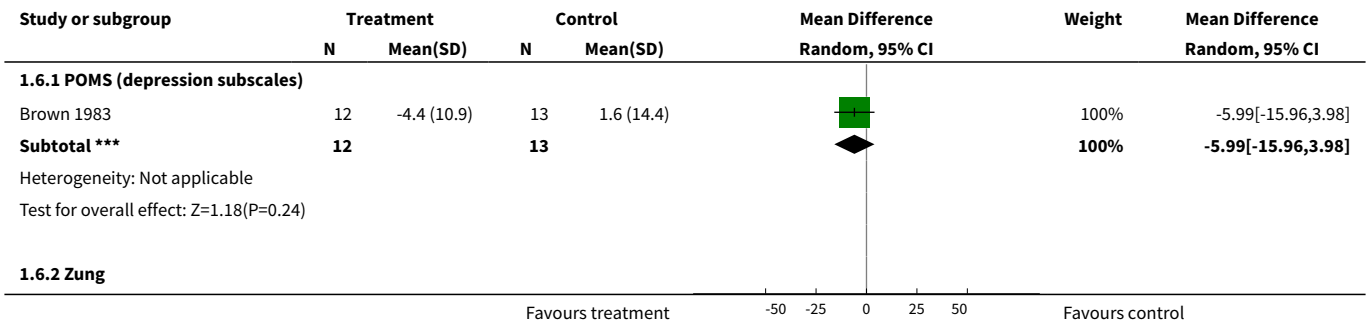
**Mental state: 1b. Average endpoint score - at 24 weeks (HAM-D, skewed data)**

| Study | Intervention | Mean | SD | N |
|---|---|---|---|---|
| Patterson 2003 | Life skill | 7.20 | 4.90 | 16 |
| Patterson 2003 | Standard care | 7.90 | 5.00 | 16 |

## Analysis 1.5. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 5 Mental state: 1a. Average endpoint scores (various scales, high score = worse).




## Analysis 1.6. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 6 Mental state: 2a. Average change scores - depression (various scales, high score = poor).





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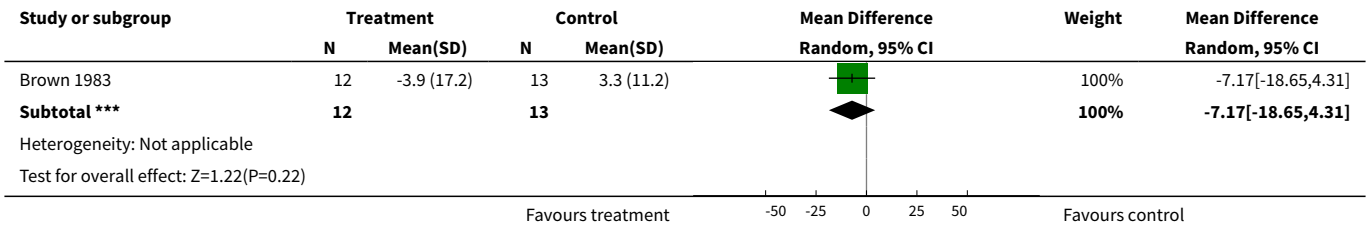
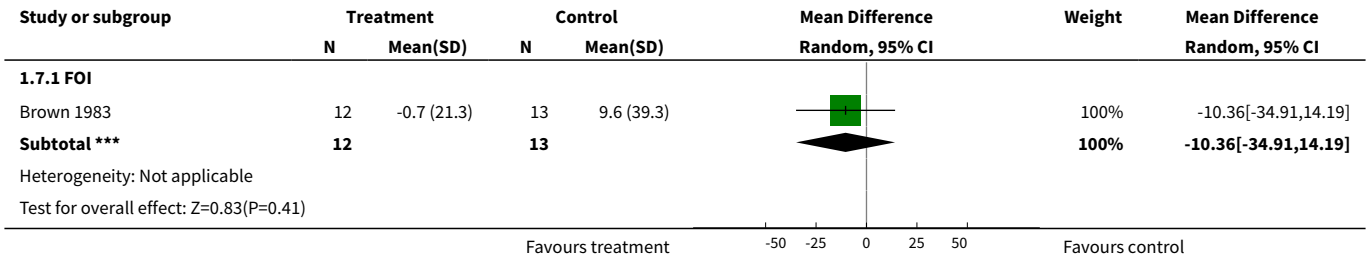
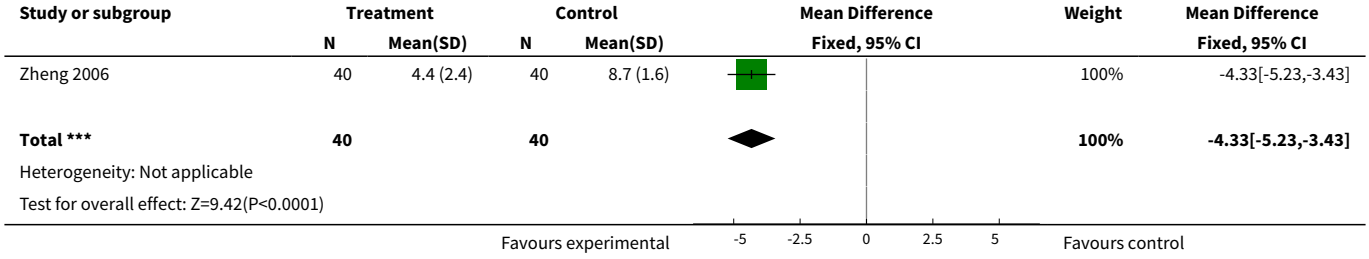


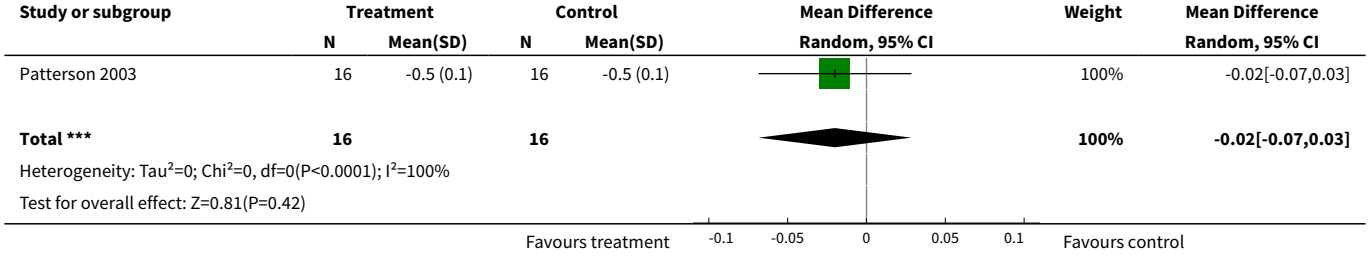

## Analysis 1.7. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 7 Mental state: 2b. Average change scores - future outlook (high score = better).




## Analysis 1.8. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 8 General functioning: Average endpoint score - at 6 weeks (SSPI, high score = worse).




## Analysis 1.9. Comparison 1 LIFE SKILLS PROGRAMME versus STANDARD CARE, Outcome 9 Quality of life: Average endpoint score - at 24 weeks (QWB, high score = better).





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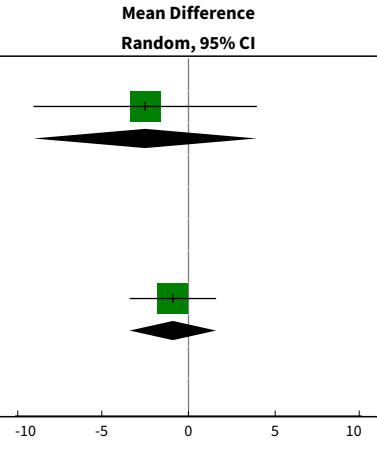
## Comparison 2. LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 1 Life skills: 1. Average endpoint score - at 24 weeks (various measures, high score = better) | 1 | | Mean Difference (IV, Random, 95% CI) | Subtotals only |
| 1.1 everyday functioning (UPSA) | 1 | 158 | Mean Difference (IV, Random, 95% CI) | -2.5 [-8.94, 3.94] |
| 1.2 social skill performance (SSPA) | 1 | 158 | Mean Difference (IV, Random, 95% CI) | -0.90 [-3.39, 1.59] |
| 2 Life skills: 2. Average endpoint score - medication management ability - at 24 weeks (MMAA, high score = worse, skewed data) | | | Other data | No numeric data |
| 3 Mental state: 1. Average endpoint score - at 24 weeks (PANSS total, high score = worse) | 1 | 158 | Mean Difference (IV, Random, 95% CI) | 2.70 [-4.78, 10.18] |
| 4 Mental state: 2. Average endpoint score - depression - at 24 weeks (Ham-D, high score = worse) | | | Other data | No numeric data |
| 5 Quality of life: Average endpoint score - at 24 weeks (QWB, high score = better) | 1 | 158 | Mean Difference (IV, Random, 95% CI) | 0.90 [-3.12, 4.92] |

### Analysis 2.1. Comparison 2 LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL, Outcome 1 Life skills: 1. Average endpoint score - at 24 weeks (various measures, high score = better).

| Study or subgroup | Treatment N | Treatment Mean(SD) | Control N | Control Mean(SD) | Mean Difference Random, 95% CI | Weight | Mean Difference Random, 95% CI |
|---|---|---|---|---|---|---|---|
| **2.1.1 everyday functioning (UPSA)** | | | | | | | |
| Patterson 2006 | 82 | -70.7 (21.7) | 76 | -68.2 (19.6) | | 100% | -2.5[-8.94,3.94] |
| **Subtotal ***** | **82** | | **76** | | | **100%** | **-2.5[-8.94,3.94]** |
| Heterogeneity: Not applicable | | | | | | | |
| Test for overall effect: Z=0.76(P=0.45) | | | | | | | |
| **2.1.2 social skill performance (SSPA)** | | | | | | | |
| Patterson 2006 | 82 | -29.3 (8.1) | 76 | -28.4 (7.8) | | 100% | -0.9[-3.39,1.59] |
| **Subtotal ***** | **82** | | **76** | | | **100%** | **-0.9[-3.39,1.59]** |
| Heterogeneity: Not applicable | | | | | | | |
| Test for overall effect: Z=0.71(P=0.48) | | | | | | | |




### Analysis 2.2. Comparison 2 LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL, Outcome 2 Life skills: 2. Average endpoint score - medication management ability - at 24 weeks (MMAA, high score = worse, skewed data).

**Life skills: 2. Average endpoint score - medication management ability - at 24 weeks (MMAA, high score = worse, skewed data)**

| Study | Intervention | Mean | SD | N |
|---|---|---|---|---|
| Patterson 2006 | Life skills | 12.70 | 9.96 | 82 |
| Patterson 2006 | Attention control | 14.60 | 9.58 | 76 |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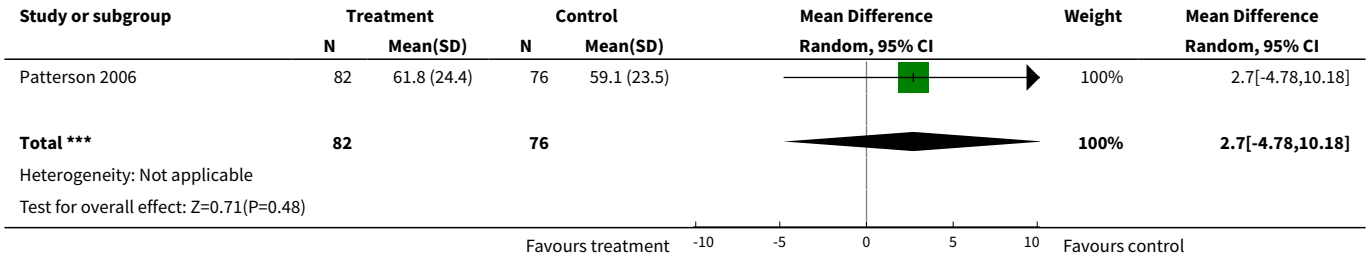
### Analysis 2.3. Comparison 2 LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL, Outcome 3 Mental state: 1. Average endpoint score - at 24 weeks (PANSS total, high score = worse).

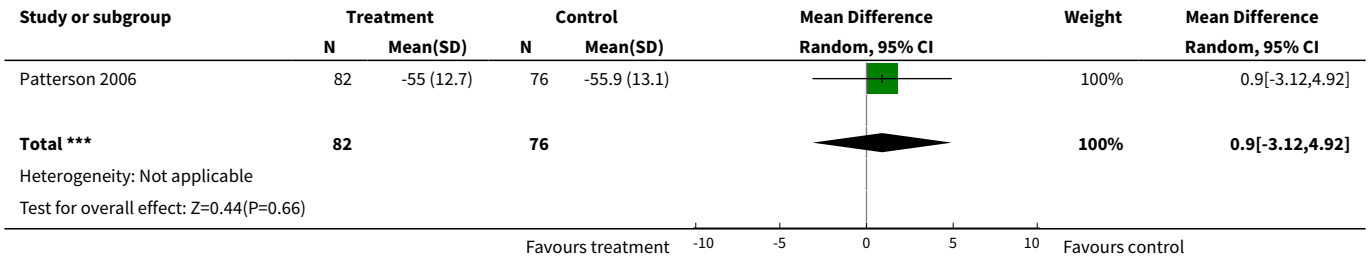



### Analysis 2.4. Comparison 2 LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL, Outcome 4 Mental state: 2. Average endpoint score - depression - at 24 weeks (Ham-D, high score = worse).

**Mental state: 2. Average endpoint score - depression - at 24 weeks (Ham-D, high score = worse)**

| Study | Intervention | Mean | SD | N |
|---|---|---|---|---|
| Patterson 2006 | Life skills | 10.20 | 8.14 | 82 |
| Patterson 2006 | Attention control | 9.70 | 7.84 | 76 |

### Analysis 2.5. Comparison 2 LIFE SKILLS PROGRAMME vs ATTENTION-CONTROL, Outcome 5 Quality of life: Average endpoint score - at 24 weeks (QWB, high score = better).




## ADDITIONAL TABLES

### Table 1. Suggested design of study

| | |
|---|---|
| **Methods** | Allocation: randomised, fully explicit description of methods of randomisation and allocation concealment.<br>Blinding: single, tested.<br>Duration: follow-up at least 52 weeks. |
| **Participants** | Diagnosis: those referred to life skills programme - diagnoses clearly described.<br>N = 300.*<br>Age: adults.<br>Sex: both. |
| **Interventions** | 1. Life skills programme - available to people in local trial centres. Clearly described by centre. N = 150. |


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**Table 1. Suggested design of study** *(Continued)*

| | |
|---|---|
| | 2. Standard care without the life skills programme. N = 150. |
| **Outcomes** | General: discontinuation, relapse, general impression of clinician (CGI), career/other, compliance with treatment., healthy days.<br><br>Service use: time in hospital.<br>Quality of life. general impression of quality of life.<br>Family burden: satisfaction with care.<br>Social functioning: return to everyday living for 80% of time, employment, specific functional outcomes.<br>Adverse events: any adverse event recorded.<br>Economic outcomes. |
| **Notes** | * Powered to be able to identify a difference of ~ 20% between groups for primary outcome with adequate degree of certainty. |

## APPENDICES

### Appendix 1. Details of previous electronic searches

1. Electronic search for the 2007 review update.
We searched the Cochrane Schizophrenia Group Trials Register (May 2007) using the phrase:

[(rehabilit* or adl* or life?skill* or life?program* or social?skill* or social?program* or self?care skill* or self?care program* or living?skill* or living?program* or community?skill* or community?program*) or ((daily and living) or (independent* and function*)) in title, abstract, index terms of REFERENCE] or [*life* or *living* in interventions of STUDY]

This register is compiled by systematic searches of major databases, handsearches and conference proceedings (see Group Module).

2. Details of previous searches

2.1 We searched the Cochrane Schizophrenia Group's Register (2003) using the phrase:

{(life* or social* or self-care* or living* or community*) and (skill* or program*)} or (daily and living) or (independent* and function) or rehabilitation in title, abstract, index terms of REFERENCE] or [life skills in interventions of STUDY]}

2.2 We searched the Cochrane Schizophrenia Group's Register of Trials (April 1998) using the phrase:

[{(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function*) or rehabilitation or #42=255 #42=or 311 or #42= 339]

2.3 The Cochrane Library (Issue 2, 1997)
We combined the Cochrane Schizophrenia Group's search strategy for chronic mental illness (see Group search strategy) with the phrase:

[and {(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function*) or rehabilitation or explode ACTIVITIES-OF-DAILY-LIVING/ all subheadings]

2.4 CINAHL (1982-04/1997)
We combined the Cochrane Schizophrenia Group's search strategy for controlled studies and chronic mental illness (see Group search strategy) with the phrase:

[and {(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function) or rehabilitation or explode ACTIVITIES-OF-DAILY-LIVING/ all topical subheadings / all age subheadings or explode COMMUNITY-LIVING/ all topical subheadings / all age subheadings or explode SELF-CARE/ all topical subheadings / all age subheadings]

2.5 EMBASE (1980-04/1997)
We combined the Cochrane Schizophrenia Group's search strategy for controlled studies and chronic mental illness (see Group search strategy) with the phrase:


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[and {(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function*) or rehabilitation or explode DAILY LIFE ACTIVITY/ all subheadings]

2.6 MEDLINE (1966-04/1997)
We combined the Cochrane Schizophrenia Group's search strategy for controlled studies and chronic mental illness (see Group search strategy) with the phrase:

[and {(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function*) or rehabilitation or explode ACTIVITIES-OF-DAILY-LIVING/ all subheadings]

2.7 PsycLIT (1974 - 04/1997)
We combined the Cochrane Schizophrenia Group's search strategy for controlled studies and chronic mental illness (see Group search strategy) with the phrase:

[and {(life or social or self-care or living or community) and (skill* or program*)} or (daily and living) or (independent* and function*) or rehabilitation or SELF-CARE-SKILLS in DE or ACTIVITIES OF DAILY LIVING in DE or INDEPENDENT LIVING PROGRAMMES in DE]

### Appendix 2. Previous Plain Language Summary

The majority of people with schizophrenia have a pattern of illness where they relapse and then have a remission. A significant number of these people become less able to look after themselves after each relapse and their lack of self-care and poorer functioning causes them to become more disabled and isolated. One possible way of helping these people, alongside medication, is to teach them life skills, the components of which are communication and financial awareness, competence in domestic tasks and personal self-care. This review looks at trials comparing life skills programmes to a control group who have access to occupational therapy, or a peer support group, where people who have a chronic mental illness were facilitated to help each other. Seven trials were found with a total of 483 participants most of whom had a diagnosis of schizophrenia or schizophrenia like disorders. The longest trial was 24 weeks and the shortest was seven weeks. The outcomes measured were improvement of general and specific skills, improvement of symptoms and a better quality of life. None of these outcomes were significantly different between the life skills, peer support and control groups although the seven trials were often measuring them in different ways, making comparison difficult. In addition, the number of people in two of the studies was very small, making it unlikely that differences would be seen between the two groups. To assess whether life skills programmes are beneficial to those with chronic mental health problems a large trial should be done using well researched scales to measure the outcomes.

(Plain language summary prepared for this review by Janey Antoniou of RETHINK, UK www.rethink.org)

## WHAT'S NEW

| Date | Event | Description |
|---|---|---|
| 15 January 2015 | Amended | Acknowledgement added. |

## HISTORY

Protocol first published: Issue 2, 1996
Review first published: Issue 3, 1998

| Date | Event | Description |
|---|---|---|
| 26 October 2011 | New citation required but conclusions have not changed | Substantial change to text and new studies added. |
| 10 June 2010 | New search has been performed | New search run, 3 studies added to included studies, 2 studies are ongoing.<br><br>Methods and analysis updated. |
| 5 August 2009 | Amended | Contact details updated. |
| 15 January 2009 | Amended | Plain Language Summary added |


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| Date | Event | Description |
|---|---|---|
| 26 April 2008 | Amended | Converted to new review format. |
| 20 February 2008 | New citation required and conclusions have changed | Substantive amendment |

## CONTRIBUTIONS OF AUTHORS

Patraporn Tungpunkom - data extraction and assimilation, searching by hand, report writing.

Karla Soares-Weiser - helped update the review in 2011 (from search run in 2010), data extraction and assimilation and report writing.

Nicola Maayan - helped update the review in 2011 (from search run in 2010), data extraction and assimilation and report writing.

## DECLARATIONS OF INTEREST

Patraporn Tungpunkom - none known.
Maggie Nicol - is professor of occupational therapy who undertakes life skills training.

## SOURCES OF SUPPORT

### Internal sources

- Faculty of Nursing, Chiang Mai University, Thailand.
- Florence Nightingale School of Nursing and Midwifery, London, UK.
- Queen Margaret College, Edinburgh, UK.

### External sources

- No sources of support supplied

## INDEX TERMS

### Medical Subject Headings (MeSH)

*Activities of Daily Living; *Adaptation, Psychological; *Social Adjustment; Chronic Disease; Mental Disorders [*rehabilitation]; Program Evaluation; Randomized Controlled Trials as Topic; Schizophrenia [rehabilitation]; Self Care [*psychology]

### MeSH check words

Adult; Humans; Middle Aged; Young Adult


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