Coping as a mediator of psychosocial impediments to optimal management and control of asthma

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Summary

Adherence to asthma medication regimens by asthma patients is often poor and contributes to the continued and substantial burden of asthma in the community. There is evidence of increased rates of behavioural problems, anxiety and depression in people with moderate-to-severe asthma and these factors may interfere with adherence and contribute to poor asthma control. An alternative explanation is that the relationship between feelings of anxiety and depression, and adherence to the treatment regimen may be more accurately predicted from the coping styles used, rather than the experience of asthma itself. The objective of this paper was to review evidence for associations between coping strategies used by asthma patients, asthma management and health outcomes. The Medline and PsychInfo databases were searched for articles containing the terms "asthma" and "coping". Patients with asthma tended to use different strategies for coping with stress and illness compared to healthy participants and individuals with other chronic illnesses. Emotion-focused coping strategies such as denial were commonly used by patients with poor medication adherence, those who attended emergency departments for asthma, were admitted to hospital for asthma, or suffered near-fatal asthma attacks. Interventions to improve coping strategies have been effective in reducing symptoms and psychological distress. The availability of coping resources to patients and/or their caregivers and the coping strategies that are used are likely to mediate the influence of psychosocial factors on the management of asthma. Further studies exploring the ways in which individuals cope with asthma will improve our understanding of the mechanisms linking psychological and social status to asthma morbidity and mortality.

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KEYWORDS

Asthma; Coping strategies; Adherence; Health outcomes; Psychosocial

Introduction

In Australia, it is estimated that one in four children,\textsuperscript{1} one in seven adolescents and one in 10 adults are affected by asthma.\textsuperscript{2} This places asthma

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as the fourth highest cause of disability in Australian women and the fifth highest in men.\textsuperscript{2}

Poor adherence to treatment regimens by patients is a particular problem in management of chronic diseases such as asthma.\textsuperscript{3} It is estimated that as many as one-half of asthma patients fail to adhere to daily treatment regimens either intentionally, unintentionally or unknowingly.\textsuperscript{4} Yet, long-term adherence to appropriate medication is the necessary link between effective asthma therapies and well-managed asthma.\textsuperscript{5}
A range of factors are likely to influence health-directed behaviour and in particular, adherence to treatment regimens. Patients’ attitudes toward their asthma, the priority of health in their lives, health beliefs, prior experiences, complexity of lifestyles, understanding of asthma and self-efficacy are all important determinants of adherence. Additionally, patients’ knowledge, attitudes and beliefs are recognised as major determinants of health behaviour including adherence with medication regimens.

Furthermore, psychological and social factors have been found to influence adherence to treatment regimens. As self-management of asthma is pivotal to minimising asthma morbidity, psychosocial factors that interfere with optimal self-management and adherence are likely to contribute to poorer asthma outcomes and even death. This is of particular concern because increased rates of psychological distress have been found in asthma patients compared to healthy individuals and those with some other medical conditions. Feelings of depression experienced by many asthma patients may arise from reduced physical capacity to carry out normal social, sexual, recreational and vocational activities. Greater psychological distress and depression are experienced by children with asthma than by children being treated for cancer or diabetes. Cross-sectional studies of children with severe asthma have found that these children have nearly three times the risk of severe behavioural and/or emotional problems. Suris et al. demonstrated that young women with asthma suffered more than controls from depressive symptoms such as feeling in a bad mood, feeling sad, believing nothing amused them, feeling depressed, and having personal problems. Strikingly in this study, participants with asthma were no more likely than controls to seek professional support, despite more symptoms of depression.

The experience of anxiety by patients with asthma may arise from the real or anticipated threat of asthma attacks. A recent review identified a number of studies demonstrating increased rates of anxiety in asthma patients. Some studies have not found anxiety to be associated with poor adherence, but others have reported associations between the level of anxiety and medication taking. It is likely that some anxiety is necessary in order to motivate patients to comply with the treatment regimen. An alternative explanation however, is that the relationship between feelings of anxiety and depression, and adherence to the treatment regimen may be more accurately predicted from the coping behaviours and strategies used by patients, rather than the experience of asthma itself. It has been found in patients with chronic illnesses other than asthma, that measures of depression are unrelated to the disease, but predictable from the coping strategies used.

Coping with asthma

Considerable stress can be experienced both by people with asthma and their caregivers that is attributable to the practical daily demands of managing asthma and not only the risk and experience of asthma attacks. Stress can be defined as a negative emotional experience accompanied by predictable physiological, biochemical, and behavioural changes.

One of the most influential cognitive-behavioural models of health behaviour is the "transactional model of stress and coping." This model provides a framework for evaluating the processes of coping with stressful events. Following this framework, the impact of a stressful event is mediated by people’s appraisal of the importance of the stressor to them (primary appraisal) and the psychological, social and cultural resources at their disposal to do something about the stressor (secondary appraisal) (Fig. 1). As such, how individuals manage stress is determined in part by the threat posed by the stressor and secondly by the resources people feel they have at their disposal to do something about the stress. Psychological distress is experienced when what is at stake is important and coping resources are judged to be less than adequate. Actual coping efforts aimed at problem management and emotional regulation give rise to the outcomes of the coping process, such as psychological well being.

Two main conceptual approaches are used to classify coping responses: The first emphasises the orientation or focus of coping (problem focussed or emotion focussed), whereas the other emphasises the method of coping (cognitive or behavioural). Problem-focussed coping (also known as approach coping) reflects cognitive and behavioural efforts to master or resolve a stressor, such that problem management strategies are directed at changing the stressful situation. Examples of problem-focussed coping include planning, information seeking and active coping. Avoidance coping on the other hand tends to be emotion focussed and reflects cognitive and behavioural attempts to change the way one thinks about the problem. Examples of avoidance coping strategies include venting anger, avoidance, and denial.
The aim of this paper is to review evidence for the association between coping strategies used by asthma patients, asthma management and health outcomes. We then review the effectiveness of interventions to improve coping strategies. Finally, we suggest that the way patients cope with stress is a possible mechanism through which other psychosocial factors act as impediments to the optimal management and control of asthma.

**Methods**

The Medline and Psychinfo databases were searched for English language articles published between 1987 and May 2002 reporting studies that investigated style of coping used by asthma patients and/or their caregivers. The reference lists of retrieved articles were subsequently searched to identify further articles that were not identified in the initial search. Initially 56 abstracts were read. Only studies that directly assessed coping style were included in this review. Studies that used a qualitative framework to investigate coping strategies were not excluded in this process. Articles were excluded if they did not determine coping styles used by participants with asthma or their carers, or they did not explicitly determine coping with a suitable research instrument, or were review papers. Retrieved articles were assessed for methodological quality utilising guidelines developed by the National Public Health Partnership and Jadad et al. Further information on study design was requested from the authors of studies if necessary. Subsequently, studies with some methodological problems, but not major problems, were included and limitations to their generalisability discussed in the text.

A total of 24 original descriptive studies and two intervention studies were found to meet these criteria and were selected for inclusion in this review. Studies that sampled adults, children and caregivers have all been included, but are discussed separately. The independent variable of interest was style of coping employed by patients with asthma or their caregivers. Associations between coping style and health or behavioural outcomes (dependent variables) were assessed including control of asthma or asthma symptoms, adherence to medication regimens, psychological or behavioural problems and use of health services.

Coping styles used by asthma patients and their caregivers

Eleven studies were identified that reported coping styles and strategies used by adults with asthma, young people or children with asthma, or their caregivers. These are summarised in Table 1.

Coping styles of adults with asthma

Only one study has investigated coping strategies used by adults with asthma. Miles et al. found that adults with brittle asthma used different coping strategies to non-brittle asthmatics. This is a clear weakness in the literature and further studies are needed to identify common coping strategies used by adults with asthma.

Coping styles of children with asthma

A qualitative study found coping strategies used by children with asthma included using medications, changing position, decreasing activity, taking fluids, relaxing, finding distractions, and social support. Ryan-Wenger and Walsh found that children most frequently used watching TV or listening to music and trying to relax as coping strategies. The coping styles of asthma patients...
<table>
<thead>
<tr>
<th>Reference</th>
<th>Study design</th>
<th>Sample</th>
<th>Instrument</th>
<th>Main findings</th>
<th>Quality rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles et al. 25</td>
<td>Case–control</td>
<td>29 brittle and 29 non-brittle adults with asthma</td>
<td>Interview responses to hypothetical slow and fast onset attacks</td>
<td>Brittle asthma was associated with altered strategies for coping with deteriorating asthma symptoms. Brittle asthmatics tended to delay seeking medical attention, preferring to rely on reliever medications.</td>
<td>Satisfactory</td>
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<tr>
<td>Austin 26</td>
<td>Case–control</td>
<td>“Families” of 90 children with epilepsy and 88 children with asthma</td>
<td>Child behaviour checklist</td>
<td>Poor adaptation found for 28% of children with epilepsy and 11% of children with asthma. Good adaptation found among 43% of children with epilepsy and 56% of children with asthma</td>
<td>Satisfactory</td>
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<tr>
<td>Brook and Tepper</td>
<td>Case–control</td>
<td>51 adolescents with asthma (80% moderate-severe) and 32 healthy controls</td>
<td>Coping responses inventory</td>
<td>Young people with asthma had significantly lower overall coping score compared with healthy controls.</td>
<td>Excellent</td>
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<tr>
<td>Carieri et al. 28</td>
<td>Cross-sectional</td>
<td>Convenience sample of 39 children with asthma</td>
<td>Open-ended interview</td>
<td>The most frequent strategies used to cope with dyspnea were medications, change in position, decreased activity, fluids, relaxation, distraction and social support.</td>
<td>Satisfactory</td>
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<tr>
<td>Noeker and Petermann 29</td>
<td>Cross-sectional</td>
<td>382 children and adolescents with asthma</td>
<td>Factors of the asthma problem behaviour checklist</td>
<td>Factor analysis resulted in a two-factor solution for the questionnaire that provided support for the Transactional Model of Stress and Coping (Lazarus and Folkman). The first factor loaded with items directed towards primary appraisal and the second factor loaded with items directed toward processes of secondary appraisal.</td>
<td>Excellent</td>
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<tr>
<td>Olson et al. 30</td>
<td>Case–control</td>
<td>175 children who attended summer camps for chronic illness in England (asthma, diabetes, arthritis) and 145 healthy controls</td>
<td>Author’s own cognitive questionnaire</td>
<td>There were no significant differences for coping or catastrophising (i.e. fearing the worst) between children with chronic illness and healthy children.</td>
<td>Excellent</td>
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<td>Author(s)</td>
<td>Study Design</td>
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<td>Ryan-Wenger and Walsh</td>
<td>Cross-sectional</td>
<td>78 children who attended a Lung Association camp</td>
<td>Schoolagers’ coping strategies inventory</td>
<td>Most frequently used coping strategies were watch TV or listen to music (68%), try to relax/stay calm (57%), say I am sorry or tell the truth (51%). Most effective coping strategies were try to relax/stay calm (77%), watch TV or listen to music (70%), and Pray (69%).</td>
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<tr>
<td>Eisner and Havermans</td>
<td>Cross-sectional</td>
<td>245 parents of children with chronic illness (diabetes, asthma, cardiac, epilepsy, cancer)</td>
<td>Coping health inventory for parents</td>
<td>Mothers and fathers used different coping strategies. Among mothers, more perceived difficulties were correlated with reports that autonomy and social support/information were more helpful strategies. Among fathers more perceived difficulties correlated with autonomy and less helpful medical care. Coping style varied with specific illness, time since diagnosis, age and gender of child.</td>
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<tr>
<td>Hentinen and Kyngas</td>
<td>Cross-sectional</td>
<td>189 parents with a child suffering chronic illness (asthma, diabetes or arthritis)</td>
<td>Authors’ own 38-item questionnaire based on the definition of coping by Lazarus and Folkman</td>
<td>Factor analysis resulted in four categories of adaptation. Factor 1 (conflicts in family) and factor 2 (sorrow and fear for child’s disease and future) demonstrate poor coping. Factor 3 (acceptance of the situation) and factor 4 (nearness and social relationships) demonstrate good coping. In families with good adaptation, there were little or no problems taking care of the child. Families with conflicts often had problems in taking care of the child.</td>
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<tr>
<td>Maillick et al.</td>
<td>Cross-sectional</td>
<td>23 parents of Hispanic or African-American children with asthma</td>
<td>COPE scale</td>
<td>Caretakers reported using active coping, planning, religion, and acceptance of the illness most frequently. Caretakers reported using restraint coping, denial, and mental disengagement least often.</td>
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<tr>
<td>Mrazek et al.</td>
<td>Prospective</td>
<td>150 parents and their unborn children genetically at risk for asthma, and 30 comparison families with no asthma in family</td>
<td>Author’s own interview-based questionnaire</td>
<td>Early parenting difficulties were a predictor for the development of asthma in children at 2 years of age in genetically at risk infants. A non-significant trend was found for the mothers judged to be coping poorly for whom 19% had children who developed asthma, compared with 10% of children whose mothers were coping well.</td>
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tend to be different to those used by healthy controls,\textsuperscript{27} and those with other chronic conditions.\textsuperscript{26,32} One study\textsuperscript{30} did not find a difference in the coping strategies used by healthy children and children with asthma, diabetes or arthritis attending a summer camp. However, in this study, the children were asked to describe their response to three general stressors, unrelated to illness (dental injection, public speaking, recent stressful event). This data collection strategy assumes coping strategies are similar or the same for all types of stressors, and not merely health-related stressors, which may not be the case, as is discussed in more detail below.

Coping styles of caregivers

Coping strategies used by parents caring for children with asthma have also been investigated. Mailick et al.\textsuperscript{34} found that caretakers of low-income Hispanic or African-American children with asthma used active coping, planning and religion most frequently and restraint coping, denial and mental disengagement least often. Eisner and Havermans\textsuperscript{32} found that coping strategies used by parents caring for children with asthma varied according to the length of time since diagnosis, and the age and gender of the child. While this study is useful as it compares coping strategies used by parents caring for children with a number of different chronic illnesses, the authors only recruited participants from self-help organisations. Presumably, parents using these self-help groups are already utilising some positive coping strategies in order to learn more about managing their children’s conditions and to seek further social support. It would have been useful to concurrently sample parents who refused to seek help from self-help/support organisations, as these parents might be utilising more negative coping strategies that may ultimately place their children at further risk of illness exacerbation.

Relationships between coping style and health outcomes

Thirteen studies were identified that determined relationships between coping styles and asthma outcomes (Table 2).

Coping style and health outcomes for adults with asthma

One study found that less perceived control of asthma was associated with use of avoidance coping strategies such as prayer.\textsuperscript{36} Four studies\textsuperscript{37–40} demonstrated that use of emotion-oriented (avoidance) coping strategies, such as denial were associated with attendance at hospital emergency departments or hospital admission following an asthma attack. Use of denial as a coping strategy was also found in adult patients who had survived a life-threatening asthma attack.\textsuperscript{41,42}

Caregiver coping style and health outcomes for children

Use of hospitals for emergency care was not related to maternal coping in a sample that included both children with asthma or diabetes.\textsuperscript{43}

Coping style and health outcomes for children

Studies of children with asthma have found relationships between coping style and self-efficacy for management of asthma,\textsuperscript{44} perception of symptoms,\textsuperscript{45} and perception of self.\textsuperscript{46}

Coping styles and adherence

Two studies\textsuperscript{47,48} have investigated the relationship between adherence and coping with asthma (Table 2). One used a qualitative interview and sampled asthma patients being treated in general practice.\textsuperscript{47} The authors identified three personality types labelled “accepters”, “deniers”, and “pragmatists”. Asthma patients were placed in these groups according to their beliefs about their asthma and their use of asthma medication. The deniers over-used reliever medication and chronically under-used preventer medication. Medication use was intimately linked to beliefs about asthma and personal coping strategies, which in turn were associated with acceptance or rejection of the identity of “asthmatic”. This inability to integrate their condition into their concept of self, thereby utilising an avoidance coping strategy, left patients at particular risk of mortality and morbidity. The second study, by Ford et al.,\textsuperscript{48} found that use of avoidance as a coping strategy was related to medication compliance in patients with hypertension, but not asthma.

Interventions to improve coping skills

Two studies have employed interventions targeted at improving coping skills for asthma patients or their parents (Table 3). One study was targeted at
<table>
<thead>
<tr>
<th>Author</th>
<th>Study type</th>
<th>Sample</th>
<th>Assessment of coping strategy</th>
<th>Main findings</th>
<th>Quality rating</th>
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<tbody>
<tr>
<td>Janson and Reed³⁶</td>
<td>Cross-sectional</td>
<td>723 adults with asthma</td>
<td>Authors’ own 69-item questionnaire with categories relating to management, coping, concerns and, quality of life</td>
<td>Participants with less perceived asthma control more likely to cope with asthma on their own by reading newspaper articles, or praying. Significantly less likely to agree with statements including family understands what it is like, doctor understands what it is like, doctor knows how to treat, feel better when talk to doctor, do not talk to doctor, feel better when talk to friends about breathing problems, do not believe treatment is available to help, and prayer helps with my breathing problems</td>
<td>Excellent</td>
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<tr>
<td>Adams et al.³⁷</td>
<td>Prospective</td>
<td>212 adults with asthma</td>
<td>Illness behaviour questionnaire</td>
<td>Less avoidance coping strategies associated with significantly reduced likelihood of hospital admission in a 12-month period</td>
<td>Excellent</td>
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<tr>
<td>Griffiths et al.³⁸</td>
<td>Case-control</td>
<td>24 south Asians and 34 white adults with asthma</td>
<td>Qualitative interview</td>
<td>South Asian and white patients admitted to hospital for asthma coped differently with asthma. South Asians described less confidence in controlling asthma, were unfamiliar with preventive medication, and often expressed less confidence in their GP. Authors conclude that different ways of coping with asthma exacerbations and accessing care may partly explain increased risk of hospital admission in south Asians</td>
<td>Excellent</td>
</tr>
<tr>
<td>Maes and Schlosser⁹</td>
<td>Cross-sectional</td>
<td>397 adults with asthma</td>
<td>Asthma coping questionnaire</td>
<td>Trait anxiety, optimism, age and lung function explain well-being. Number of hospital admissions for asthma in the past year was determined primarily by lung function, coping with asthma in daily life, and shame. Amount of medication taken in last week determined by number of attacks and maintaining a restrictive lifestyle. Number of days absent from work in past year explained by number of attacks, shame and reacting emotionally in attack and maintaining restrictive lifestyle</td>
<td>Excellent</td>
</tr>
<tr>
<td>Sexton et al.⁴⁰</td>
<td>Cross-sectional</td>
<td>99 adults with asthma</td>
<td>The Jaloweic coping scale</td>
<td>Mean coping score on the instrument was 102.6 (maximum possible 200) indicating participants used a moderate number of coping strategies. Most frequently used coping strategies were trying to maintain control, finding out more, thinking of ways to handle the situation and looking at problems</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Author</td>
<td>Study type</td>
<td>Sample</td>
<td>Assessment of coping strategy</td>
<td>Main findings</td>
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<tr>
<td>Campbell et al.</td>
<td>Cross-sectional</td>
<td>77 consecutive adult cases of near-fatal asthma</td>
<td>Denial sub-scale of the illness behaviour questionnaire</td>
<td>objectively. Eight out of nine most commonly used coping strategies were problem oriented. Participants who went to the ED used more emotion-oriented coping strategies than those who never sought care and females used more emotion coping strategies. Those who scored higher on denial were less likely to report as progressive respiratory distress, and more likely to report as sudden collapse. Denial not associated with lost days, extent to which asthma interfered with daily activity or with feelings of stigma</td>
<td>Excellent</td>
</tr>
<tr>
<td>Yellowlees and Ruffin</td>
<td>Cross-sectional</td>
<td>25 survivors of a life threatening asthma attack</td>
<td>Illness behaviour questionnaire and the lie scale of the Eysenck personality inventory</td>
<td>10 of 25 patients had a DSM-III psychiatric diagnosis (anxiety (9) or depression (1)). Denial scores for the asthma patients on the Eysenck were higher than published norms for the population. Similarly, denial scores on the illness behaviour questionnaire were higher than previously reported norms. Both gender and the presence of different chronic illness were associated with children’s self-competence and family functioning, but not maternal coping. Number of hospitalisations was not related to maternal coping</td>
<td>Excellent</td>
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<tr>
<td>Holden et al.</td>
<td>Case–control</td>
<td>72 children with diabetes and 40 children with asthma and their parents</td>
<td>Coping health inventory for parents</td>
<td>Higher self-efficacy expectations were related to more adequate coping mechanisms</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Schlosser and Havermans</td>
<td>Cross-sectional</td>
<td>60 children with asthma or asthma-bronchitis</td>
<td>Asthma coping questionnaire for children</td>
<td>Children classified as repressors were more accurate than children classified as non-repressors at predicting their PEFR and FEF. Attitudes, satisfaction with family and negative coping had the strongest association with self-concept. Negative and positive coping and total family resources correlated at both time points.</td>
<td>Excellent</td>
</tr>
<tr>
<td>Fritz et al.</td>
<td>Cross-sectional</td>
<td>86 children and parents with asthma</td>
<td>Weinberger adjustment inventory</td>
<td></td>
<td>Excellent</td>
</tr>
<tr>
<td>Mcneils et al.</td>
<td>Prospective</td>
<td>106 children with asthma and their families</td>
<td>Coping health inventory for children</td>
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<td>Excellent</td>
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Coping as a mechanism for understanding how social factors contribute to sub-optimal asthma management and control of symptoms

Social support

Social support is an integral part of the coping process\(^{51}\) that may have both direct effects and “stress buffering” effects on well-being.\(^{22}\) A social network consists of a person’s relationships with relatives, friends, neighbours, coworkers, and other acquaintances who interact with the person. Families utilise different members of the social network for different needs. Unger and Powell\(^{52}\) surmise that social networks provide three types of aid: (a) instrumental support (material goods, etc.), (b) emotional or social support and (c) referral and information.

We did not identify any studies that explored how coping strategies related to levels of social support for asthma patients. However, it has been found that good levels of social support were an important determinant of well-controlled asthma. In a cross-sectional study of 219 parents of children with asthma, being a single mother and having less social support was associated with poorer parental mental health and the child’s asthma status.\(^{53}\) Conversely, having more children and both parents in the home were found to be protective for parental mental health. Unfortunately, asthma sufferers often have inadequate levels of social support. A pilot study that investigated level of social support available to 80 young people and adults with moderate/severe asthma attending an asthma clinic found that 24% of patients had inadequate social support (determined as participants reporting either no support person or support person unavailable during acute attack, unsatisfactory help, or support person causing high levels of conflict in the previous year).\(^{54}\)

The reported associations between level of social support and asthma control may work by influencing key processes that are central to the Transactional Model of Stress and Coping.\(^{21}\) For example, the availability of friends or family to talk to about...
## Table 3  Interventions to improve coping skills.

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design</th>
<th>Sample</th>
<th>Intervention(s)</th>
<th>Principal findings</th>
<th>Quality rating (max 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colland et al.</td>
<td>RCT with placebo</td>
<td>112 children with inadequate self-management for asthma</td>
<td>Combination of behavioural techniques, self-management training, developmental psychology and group therapy techniques</td>
<td>Significant improvements for waking at night, daily activity restrictions and days lost in experimental group compared to control groups. Coping scores and asthma knowledge improved significantly for intervention group compared to the two control groups 3 weeks and 6 months after training. Significant reduction in trait and state anxiety between intervention and controls posttraining 3 weeks after training but not at 6 months.</td>
<td>3</td>
</tr>
<tr>
<td>Dolinar et al.</td>
<td>RCT</td>
<td>40 parents of children with asthma per group</td>
<td>Single face-to-face asthma health education session based on the air-force asthma program + a booklet representing conventional care</td>
<td>Parents in the experimental group perceived an improvement in their child’s asthma. Postintervention, the experimental group differed significantly on coping sub-scales indicating less need for information, reduced concerns, and increased utilisation of coping strategies.</td>
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</table>

RCT—randomised controlled trial.
asthma may affect a person's perception of personal risk or of severity of their asthma. Further research exploring the link between social support and coping with stress in asthma is needed.

Family factors

Family conflict has been identified as a contributing factor to poor paediatric adherence and death due to asthma.\textsuperscript{5,55-57} Family problems, among a range of psychosocial factors, have been found to be associated with risk of death from asthma attacks.\textsuperscript{55,57} While we identified a number of studies that determined coping strategies used by caregivers, none examined relationships between coping style, family dysfunction and asthma symptoms (previously discussed).

In a separate line of investigation, Wamboldt et al.\textsuperscript{58} used the Five Minute Speech Sample (FMSS) technique to examine the relationship between parent–child interactions and medical outcomes for 19 adolescent patients admitted with severe-chronic asthma. The FMSS is a brief measure of expressed emotion and includes ratings of parental criticism (negative statements or criticisms of the child's illness) and emotional over-involvement.\textsuperscript{58} Parental criticism was associated with worse medication adherence, but not asthma severity or dose of corticosteroid on admission. Interestingly, high parental criticism was associated with lower asthma severity at discharge and less steroid medication at discharge. The authors suggested that adolescents with more critical parents respond better to treatment. That is, when young people were outside of the home environment their asthma improved. These findings suggest that the home environment and the family relationship are important determinants of asthma control. Indeed, a recent systematic review of the benefits of family therapy for children with asthma concluded that family therapy may be a useful adjunct to medication for children with asthma, although this conclusion was based on only two trials.\textsuperscript{59}

The quality of relationships within the family exerts an important effect on the management of illness and the psychological outcomes for family members.\textsuperscript{60} It can be concluded that family dysfunction is a significant risk factor for sub-optimal asthma management. For children especially, the family is the principal support network. Family dysfunction may act directly as a barrier to optimal asthma management through families not providing adequate, consistent or timely care of dependents with asthma.\textsuperscript{45} Alternatively, it could act indirectly by increasing the psychological distress of the child or adult with asthma and limiting ability for coping with stress.\textsuperscript{61} There are likely to be reciprocal interactions between family members with and those without asthma, whereby the illness places stress on the family and likewise, the family either contributes to or buffers stress experienced by the asthma patient. Further empirical evidence for the importance of the family to the coping process comes from a study by Hamlett et al.\textsuperscript{60} They found that the resources available to the family such as social support, and competencies of individual family members may help distinguish between families who successfully "weather the crises and changes" associated with their child's illness, and those families who are less adaptive at coping with this stressor.

Socioeconomic considerations

Socioeconomic indicators such as not finishing high school, being a member of a minority ethnic group,\textsuperscript{9,37,62} or a single-parent family\textsuperscript{54} have all been independently associated with asthma status, poor medication adherence and use of emergency departments for asthma. However, associations tend to be weak and vary between studies.

While many studies fail to find social risk factors for asthma morbidity, there is evidence that asthma patients within the lowest socioeconomic bracket are adversely burdened by asthma.\textsuperscript{63} The reasons for this most likely operate through a complex interplay of factors such as greater exposure to causes and trigger factors arising from poorer housing or because of financial barriers to quality health care and medication.\textsuperscript{54} Additionally, behavioural risk factors such as smoking are more prevalent in lower SES groups and are associated with a diagnosis of asthma\textsuperscript{64} and more frequent hospital admissions. Furthermore, mental disorders and family dysfunction are more common in the economically disadvantaged\textsuperscript{65} and may contribute to poorer asthma control, non-adherence and inappropriate use of health services.

A question that arises from the study of social risk factors for illness, such as asthma, is why some individuals are negatively affected by life events requiring adaptation, while others weather the storm?\textsuperscript{26} Individual factors including how these events are perceived and the way that coping strategies are used may influence the impact of stressful life events on development of disease, health behaviour and illness outcomes. Another explanation is that individuals repeatedly exposed to aversive events they cannot predict or control such as poverty, adverse life events and living in an unsafe or unpredictable environment may use inappropriate coping strategies that may be associated with sub-optimal asthma self-management.\textsuperscript{62} Indeed, in their study of 44
African-American children and adolescents from low-income families, Zlatich et al. found that a greater number and severity of adverse life events were associated with less favourable responses to medical treatment. Alternatively, socioeconomic disadvantage may be a result of direct or indirect effects of asthma such as loss of income through days off work, cost of medication, and cost of medical care. However, financial problems have been associated with admission to hospital for severe asthma in a number of studies, even when there is relatively uniform access to medical care and subsidised pharmaceuticals, as in countries such as Australia and New Zealand.

Discussion

Mechanisms linking psychological and social status to asthma morbidity and mortality remain largely undefined. However, there is considerable evidence that psychosocial factors influence the ability of patients with asthma to manage their condition and are important determinants of symptom control. The availability of coping resources to patients and/or their caregivers and the coping strategies used are likely to mediate the influence of these factors on the management of asthma. Investigation of ways in which patients and/or their caregivers cope with asthma will provide further understanding of these mechanisms.

Further research is needed to delineate the temporal relationship between asthma symptoms, adherence with medication regimens, and how asthma is experienced by patients given their unique social situations. Furthermore, studies that identify the coping strategies associated with positive and negative asthma outcomes and in particular, the balance of problem-focussed and emotion-focussed coping that is most adaptive would be valuable as these findings could subsequently be incorporated into asthma education programs. While the studies reviewed here have demonstrated an association between use of emergency care and avoidance coping, there has been little work investigating the relationship between coping style and asthma management, in particular adherence with asthma medication regimens. There is evidence that one of the most stressful aspects of chronic illness is the need for continual adherence to care regimens. As adherence is a key component of asthma management, investigation of the way in which coping styles are related to adherence may explain more of the variance in psychosocial factors that predict adherence with asthma treatment regimens.

For the patient with asthma (or their carers), denial of asthma, or the severity of asthma is one of the best-known coping strategies, which is associated with a risk of life-threatening asthma attacks. Denial is a form of emotional regulation whereby the way an individual thinks about the stressor is changed, rather than trying to change the stressor itself. It is logical to assume that situations, which can be controlled, are better dealt with in a problem-focussed fashion, whereas emotion-focussed coping may be a superior strategy in situations beyond control. For patients with persistent asthma, optimal asthma management involves adhering to a medication regimen, which requires a considerable degree of knowledge about the medications and trigger factors, as well as a positive attitude toward asthma management. In the case of such a variable and often unpredictable condition as asthma, down-playing the severity of symptoms or risk of exacerbations could be seen as beneficial by reducing or limiting anxiety.

However, as these studies demonstrate, denial as a coping strategy is a significant risk factor for asthma attacks requiring attendance at hospital emergency departments and near-fatal asthma attacks. Further studies are needed to identify the most adaptive blends of problem-focussed and emotion-focussed coping strategies that are associated with optimal asthma management.

Interventions aimed specifically at improving coping strategies have been shown to benefit patients by improving management of symptoms and reducing feelings of psychological distress, particularly anxiety. Colland et al. demonstrated that teaching children with asthma better ways to cope with their asthma, could also reduce the psychological impact of asthma, specifically, anxiety associated with living with asthma. It is perhaps surprising that so little research has focussed on relationships between coping style and psychological distress in asthma patients. This intervention, together with a small number of observational studies demonstrate that this may be a fruitful avenue of investigation, with potential clinical benefits for some sub-groups of patients with poorly controlled asthma. Further randomised controlled trials are needed, with adequate sample sizes and validated measurement instruments. Such trials could identify characteristics of patients who benefit most from these interventions, and which aspects of the interventions are of most benefit to patients, so that these lessons can be applied to clinical settings.
A number of methodological issues are raised by these studies of coping styles. For example, one important finding is that it may be inappropriate to extrapolate findings from one medical condition to another. This assumes that coping with stress is situation-specific, i.e., coping with chronic disease is a function of specific difficulties associated with the condition. In the case of individuals and families managing asthma, one of the most challenging and unique aspects of living with asthma is the unpredictable nature of symptoms and potentially frightening attacks of dyspnoea. This raises the question of what instruments are most appropriate to collect data of this nature. Should a generic coping instrument be used, an illness-specific instrument, or alternatively, because the illness experience is so subjective, should a qualitative interview be used to collect data on coping strategies?

Another question to arise from these studies is whether or not style of coping should be measured as a trait or state-variable. That is, whether coping strategies remain stable or change over time. McNeils et al.46 found negative and positive coping scores were highly correlated when measured at two time points 4 years apart. However, Lazarus and Folkman20 in their transactional model of coping advocated a state-based approach to coping. In support of this approach, within the asthma literature qualitative studies have alluded to the figure. Jerret and Costello70 describe this as a process of gaining control. Their qualitative study explored parents’ experiences of coming to terms with and becoming effective managers of their children’s asthma. They studied the experiences of 30 families with children aged between 2 and 13 years of age. The major theme that emerged from the analysis of in-depth interviews was labelled “gaining control”. The analysis revealed that coming to grips with the child’s asthma and integrating its management into family life were the primary issues for parents. Initially, the parents reported feeling out of control and that they did not understand the disorder or how to manage it. Over time, they sought information from a number of sources, used trial and error, and made lifestyle changes until they felt in control of their child’s asthma.

Conclusion

Health-care professionals at the “coal face” of asthma management, namely physicians, asthma educators and pharmacists, need to work with patients towards the shared goal of enhancing coping by addressing the psychosocial factors that impact on their patients’ asthma control.68 The evidence reported here demonstrates that the coping style of patients is an important predictor of asthma morbidity. Focussing attention on this area during the clinical consultation, and guiding patients toward the use of problem-focussed coping strategies, could be particularly beneficial to patients with asthma. This involves recognising that human behaviour both shapes and is shaped by the social environment.71

While health professionals cannot change their patients’ social situations, by working together with patients to develop positive problem management skills and coping strategies, they can minimise the influence of psychosocial impediments to optimal control of asthma.

Acknowledgements

Christopher Barton is supported by a National Health and Medical Research Council of Australia Ph.D. scholarship. The authors thank Dr. Maes and Dr. Schlosser and the publishers of Current Psychology Research Reviews for permission to reproduce the figure.

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