Understanding exercise uptake and adherence for people with chronic conditions: a new model demonstrating the importance of exercise identity, benefits of attending and support

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Received on October 7, 2010; accepted on May 26, 2011

Abstract

Understanding the factors influencing uptake and adherence to exercise for people with chronic conditions from different ages, genders and ethnicities is important for planning exercise services. This paper presents evidence supporting a new model of exercise uptake and adherence applicable to people with chronic conditions from diverse socio-demographic backgrounds. The study is based on 130 semi-structured interviews with people with chronic conditions, including both those who did and those who did not attend exercise services, and supporters of those who attended. Analysis followed the guidelines of ‘framework analysis’. Results show that three factors were particularly important in influencing adherence behavior: (i) exercise identity, (ii) support and (iii) perceived benefits of attending. Social and cultural identities impacted on willingness to exercise, importance of exercise and perceived appropriateness of exercising. Having at least one supporter providing different types of support was associated with high levels of attendance. Those people who valued the social and psychological benefits of attending were more likely to be high attenders. The new model illustrates interaction between these three factors and discusses how these can be taken into account when planning exercise services for people with chronic conditions drawn from diverse socio-demographic groups.

Introduction

Exercise is recommended for the prevention and treatment of chronic conditions [1, 2]. Primary Care Trusts all over England fund exercise programmes to increase physical activity among sedentary people and people with chronic conditions, but non-uptake and low adherence to services is a widespread problem. Previously, little was understood about influences on different levels of participation in these exercise programmes, especially among people of different age groups and different ethnic groups. Previous research has not used sufficiently diverse samples (by age, gender, ethnicity and attendance level) to explicate any differences in influences on exercise participation for different socio-demographic groups.

The most influential theories in the exercise adherence literature at present are Bandura’s social cognitive model [3] and the transtheoretical model [4] and the most useful theoretical constructs in promoting adherence to regular exercise are included in these theories. They include self-efficacy, social support, self-monitoring, outcome expectations, addressing barriers to exercise, goal setting and follow-up [5–7]. Increasing self-efficacy [3] in particular has been central to many exercise interventions achieving good adherence [5–9]; however, self-efficacy has not been able to predict uptake [9–11] or dropout to exercise interventions for in-experienced exercisers [12]. Prochaska and Marcus [4] suggest that within the Transtheoretical Model,
self-efficacy is likely to be limited to predict progress in action and maintenance stages (uptake and adherence) and not in stages of precontemplation, contemplation or relapse (non-uptake or dropout). The studies that have shown these constructs to be useful have typically been from outside the United Kingdom and based on predominantly white and healthy subjects (5). They have not included people who did not take up the interventions. The studies have been mainly quantitative and used samples that do not reflect the population with chronic conditions invited to community-based exercise services.

A number of qualitative studies have provided some insight into factors influencing participation in exercise services for sedentary people with chronic conditions. Hendry et al. [13] found that people who had not participated in an exercise scheme had less encouragement, found exercise in a gym to be unappealing and thought that exercise would be harmful. However, this is a small study of older people with Osteoarthritis, so findings are not widely generalizable. A study by Gauvin et al. [14] found the positive relationship with the exercise advisors and the support they provided was a strong influence on unusually high retention rates. Jones et al. [15] interviewed patients who had been participating in a cardiac rehabilitation programme. Lack of motivation, difficulties of getting to the schemes and expectations of the scheme being ‘for old people’ were factors influencing low attendance. Gender and ethnic differences in motivation to attend were detected. However, attendance data were not carefully measured and therefore no conclusions could be drawn on any differences between non-adherence and adherence in this study. Wormald and Ingle [16] compared non-completers with completers of an exercise referral scheme using focus groups and found that participants liked the provision of support and supervision, and opportunities to meet people, however, generalizability of this study is limited as all respondents were white.

The current understanding of factors associated with uptake and adherence for people with chronic conditions is thus incomplete as samples have not been sufficiently diverse. This study fills an important gap by identifying the influences on uptake and adherence behavior for people with chronic conditions, using a diverse sample by age, gender, ethnicity and attendance level and presenting a new model of exercise uptake and adherence, with implications for a diverse range of people.

## Materials and methods

Attenders and non-attenders, young and older age groups, males and females and white, black African and black Caribbean groups within two boroughs of South London were identified as foci for the research. Definitions of non-, low and high attendance are given in Table I. We aimed to include at least five people from each age (18–29, 30–39, 40–49, 50–59, 60–69 and 70+ years); gender, ethnicity and attendance category and participants were selected on this basis (see Table II). Three exercise-on-referral services and one pulmonary rehabilitation service agreed to participate in study recruitment. These exercise services provided between 8 and 12 weeks of group exercise sessions following a consultation with an exercise specialist. The inclusion and exclusion criteria can be found in Table III. Researchers were sent names of potential participants with contact details, attendance category and details of their age, gender and ethnicity, which were verified during interviewing. Due to low numbers of younger and male people being sent by exercise services, sampling was extended to opportunistic recruitment at community venues, which included local authority facilities, and Primary Care Trust subsidized exercise classes. Community recruitment involved asking participants if they had at least one of the chronic conditions listed by the exercise schemes; their attendance level was confirmed during interview. To explore ‘support’ in more depth and to verify the accounts of participants, those named as ‘most supportive’ by attenders of exercise services were approached for interview.

One hundred and sixteen in-depth semi-structured interviews were transcribed in full and analyzed (see Table III), plus 14 named supporters of people who had attended. Interview questions explored experiences of exercise and physical activity before during and after attending, and influences on attending or not attending, and experiences of supporting those
who attended. Sample questions were from the ‘Before attending’ section of the topic guide, ‘What made it (easy/difficult) for you to attend’, and ‘What discussion did you have with anyone else about (exercise/the service?)’, from the ‘During attending’ section: ‘What in your view are the good/bad things

Table I. Definitions of attendance levels

<table>
<thead>
<tr>
<th>Attendance category</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Non-attenders</td>
<td>For people referred to exercise services: did not attend the initial consultation or any other appointment thereafter. Non-attenders either did not respond to a letter or phone call inviting them to attend an initial exercise consultation or may have made an appointment but did not attend. For people recruited from the community: has not attended supervised exercise sessions for at least 6 months and is not adding physical activity to normal daily tasks.</td>
</tr>
<tr>
<td>Low attendance</td>
<td>For people referred to exercise services: attended an initial exercise consultation and then did not attend subsequent exercise sessions or attended exercise sessions but did not ‘complete’ according to the individual exercise services criteria. For people recruited from the community: has attended supervised exercise sessions but stopped attending in the last 6 months or has been adding physical activity to normal daily tasks at least weekly in the last 6 months but stopped.</td>
</tr>
<tr>
<td>High attendance</td>
<td>For people referred to exercise services: someone who completed the exercise service according to the referral scheme criteria For people recruited from the community: currently attending supervised exercise sessions, or adds physical activity on top of normal daily tasks at least weekly.</td>
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The services differed in the number of exercise sessions that were offered. For example, the criterion for a completer from the pulmonary rehabilitation service was someone who attended eight consecutive sessions, whereas for Southwark exercise referral programme completers attended a total of 20 sessions.

Table II. Inclusion and exclusion criteria for the study

<table>
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<tr>
<th>Inclusion criteriaa</th>
<th>Exclusion criteria</th>
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<tr>
<td>Sedentary lifestyle, with the desire to increase their physical activity level. PLUS at least one of the following: Hypertension Hypercholesterolemia Obesity Osteoarthritis Respiratory problems Stable and controlled coronary heart disease or peripheral vascular disease Cerebrovascular accident Diabetes Hyperlipidemia Mild to moderate depression/stress/anxiety Asthma/chronic obstructive pulmonary disease/stable chronic lung disease</td>
<td>Unstable angina BP $\geq$ 180/100 mmHg BP drop $&gt;$ 20 mmHg during exercise Uncontrolled cardiac arrhythmia or tachycardia Unstable or acute heart failure/last in-patient cardiac event $&lt;$6 months Febrile illness Inability to communicate in English</td>
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</table>

People recruited from the community were also included according to these criteria, established during recruitment and verified during the interview.

aGeneral Practitioners referred participants according to the above inclusion and exclusion criteria. All respondents to the research were sedentary with at least one of the conditions named in the inclusion criteria.
Data analysis was carried out in five distinct stages following ‘Framework’ [17] see Table IV. Framework analysis followed an iterative and generative approach, looking for patterns and associations derived from the respondents’ accounts of their views and experiences of engaging or not engaging in physical activity and generating theory by testing rival explanations, identifying emergent explanations and testing hypotheses within the data [18]. Framework was selected on the grounds that: it was driven by the original accounts and observations of the people it was about; it enabled comparisons between, and associations within cases to be made, and the analytic process and the interpretations derived from it, could be viewed and judged by people other than the primary analyst [18]. Nvivo 2 qualitative analysis software assisted in the management and retrieval of data.

An initial thematic framework was developed by three researchers after familiarization with 33 interviews to identify preliminary: (i) key issues (issues) about attending or not attending raised by participants and (ii) analytical themes (themes) arising from the recurrence or patterning of particular views or experiences. An example of an issue is ‘having the same symptoms as others’, or ‘enjoying talking to others in the group’, being placed into the theme of ‘fitting in’. This framework was then applied to the remainder of the transcribed interviews by identifying sections of text that reflected issues and themes (indexing). Any further emergent issues and themes were added. A sample of six indexed transcripts was cross-checked by the principal investigator and a second researcher. Following indexing, charting commenced. Charts comprised participants and their demographic characteristics (age was analyzed by decade) on the y-axis and the issues for each category on the x-axis. Text was lifted from the original transcript where issues occurred and inserted into the chart. Charts could then be sorted and synthesized according to emerging issues and themes and similarities or differences between the demographic groups. Mind map diagrams were drawn to start to categorize connected groups of issues and themes. The diagrams evolved during the charting and mapping and interpretation stages. Three core categories were identified which were ‘exercise identity’, ‘support’ and ‘perceived benefits of attending’. Core categories incorporated related and recurring patterns of issues and themes that accounted for non-attendance or attendance behavior.

The mapping and interpretation stage involved a generative and iterative process of identifying a theme or association within the data and then

### Table III. Demographic characteristics of participants

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18–44 years</td>
<td>45+ years</td>
<td>18–44 years</td>
<td>45+ years</td>
</tr>
<tr>
<td>Level of attendance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low n = 45 (39%)</td>
<td>BA</td>
<td>BC</td>
<td>W</td>
<td>BA</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>High n = 40 (34%)</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Non n = 31 (27%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>44</td>
<td></td>
<td></td>
<td>72</td>
</tr>
<tr>
<td>Grand Total</td>
<td>(38%)</td>
<td></td>
<td></td>
<td>(62%)</td>
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</table>

BA = black African  
BC = black Caribbean  
W = white.

*Participants were specifically targeted for participation in order to achieve at least five participants in each of the age, gender, ethnicity and attendance categories, as can be seen the target was not achieved in all cases.
formulating and testing hypotheses within the data rather than setting out to explore pre-existing hypotheses [19]. Relationships and associations were reformulated until there was confidence that they fitted with the respondents’ accounts by returning back to the data and making any necessary adjustments to the diagrams. The diagrams captured the views and experiences of all participants when all three diagrams are viewed together. Any deviant cases were noted and elaborations made to the model until the analysis explained all of the respondents’ accounts [20].

The new model for exercise uptake and adherence behavior for people attending exercise services summarizes the interaction between the core categories and their combined influence on uptake and adherence to exercise services. The model was revised and developed by checking it against the post interview notes and charts.

Ethical approval was granted by Bromley Local Research Ethics Committee on 20 July 2006 and Research Governance approval was granted by Lambeth and Southwark Primary Care Trusts on 12 September 2006.

Findings

The three core categories of exercise identity, benefits of attending and support are considered in turn below, following which, their integration into a model for understanding exercise uptake and adherence behavior is discussed. All names are pseudonyms.

Exercise identity

Exercise identity is defined here as the way in which a person describes themselves in relation to exercise or physical activity and the way this description influences their behavior. Participants often explained their image of themselves as a reason for their exercise behavior. The analysis identified three major influences on exercise identity which were (i) social and cultural norms, (ii) importance of exercise and (iii) confidence to exercise (see Fig. 1). Dominant gender, cultural and age identities had an impact on expectations of appropriateness, which in turn influenced confidence to exercise, and importance of exercising. Confidence to exercise and importance to exercise independently impacted on willingness to overcome pre-existing social or cultural identities in order to exercise.

Men and women expressed gender identities, which influenced their reasons for attending (see Fig. 1). The importance for men to continue to see themselves as sporty or active had a positive

<table>
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<th>Table IV. The stages of ‘Framework’ analysis</th>
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<td>Stages of analysis</td>
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<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Familiarization</td>
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<tr>
<td>Identifying a thematic framework</td>
</tr>
<tr>
<td>Indexing</td>
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<tr>
<td>Charting</td>
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<tr>
<td>Mapping and interpretation</td>
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</table>

Adapted from Ritchie and Spencer [18]
influence on their attendance at exercise services, whereas women’s motivation was more associated with improving health or well-being. Issues for men of all age groups included comparing themselves with others and expecting to feel intimidated and lacking confidence to exercise with men who were younger, stronger, more muscular, slimmer or fitter. Lee Green’s (black Caribbean, male, 30–39, non-attendance) experience was of gym instructors being ‘young and fit’ and he said he felt uncomfortable exercising there and did not take up the exercise referral as he would prefer to swim: ‘would not look like such a fool’.

Expectations of physical ability in comparison to others based upon age influenced exercise identity and willingness to participate in exercise services. Not wanting to attend alongside other people thought to be younger than oneself (and therefore fitter, thinner or healthier) was a barrier to attendance for both men and women. Ivy Elder (white, female, 60–69, low attender) had stopped attending and explained:

... plus as well a lot of the people were so much younger than me as well. So when you’re sort of an elderly person with a plumpy body [laughs].

Participants aged 18–29 years spoke about noticing an age difference and not fitting in or feeling ‘isolated’ (Rachel Greene, Black Caribbean, female, 18–29, low attendance) or ‘not my group’ (Ryan Dillon, Black Caribbean, male, 18–29, non-attendance). This was enough reason to not start or stop attending.

Among our sample, dominant-nurturing identities among women affected non-uptake and low attendance most consistently. Nurturing identities were more common in black African women (46%) than black Caribbean or white (28 and 27%, respectively). Attendance at exercise services was viewed as creating stress in two ways: (i) finding time to exercise in the presence of family related time pressures and (ii) prioritizing self over others causing conflict with their accepted roles as nurturers.

Several African participants spoke specifically of the cultural identities that are in direct opposition to exercise identities (see Fig. 1). Some African participants attributed their overweight size and shape to being African, indicating that this is normal, acceptable and socially attractive:

If you are a big man you are a BIG man! (Gabriel England, black African, male, 40-49, non-attendance).

...I don’t want to go too skinny [laughs]. (Nana Aud, Black African, female, 40–49, low attendance).

Cultural identity was preserved through maintaining a culturally acceptable body size, which included
following culturally acceptable norms for levels of physical activity but both black and white participants expressed low importance for attending by saying they were active enough.

Many participants had low confidence to exercise associated with weak exercise identities, and this was affected by low self-image and/or depression:

I’m not interested. I just kind of felt really out of place running around with all these you know size 8’s and I just thought you know I’m not interested, I don’t want to do it. (Roz Smith, Black Caribbean, female, 40–49, non-attendance).

Only skinny people go to gyms …I am not going to get like that, what’s the point in coming. (Chris Nash, white, female, 30–39, low attendance).

General feelings of helplessness and lacking control over their health were reported for those with low confidence to exercise and these people were also less likely to engage with individuals or groups offering support. Where exercise and its potential benefits were considered to be very important, even in the presence of dominant social and cultural identities and low exercise identity, exercise was more likely to take place.

Perceived benefits of attending
Positive social or psychological benefits of attending were more meaningful to high attenders than measurable physiological health benefits, such as reduced blood pressure or weight (see Fig. 2). The social benefits that were spoken about most often were ‘comparison with others’ and ‘group support’. Comparisons to others led to gaining an understanding about how different people were coping with their condition and comparatively how incapacitated they were and helped to put their own problems in perspective and reduce anxiety:

There’s a lot of people like myself which I met, it was helpful because when I saw other people with similar,—and worse—than me I really appreciate it . . . it made me try to, try to work harder. (Malcolm Leedale, black Caribbean, male, 60–69, high attendance).

These social factors had psychological benefits including increased confidence to exercise and increased optimism about the future (see in Fig. 2).

Witnessing other people try and help themselves by exercising and perceiving them to be similar influenced the feeling of being part of a group and was a motivating factor on attendance. This was reflected in how different participants referred to the exercise group as a ‘congregation’ where everyone was ‘joining in’, as ‘friendly’, ‘like a club’, ‘we were a CROWD’, ‘feel like you belong’ and ‘welcoming’. These experiences have enhanced the participants’ experience of enjoyment of attending and helped to reduce their anxiety about exercising. Others who did not experience feeling group cohesion were less likely to continue which was often associated with weak exercise identity, low importance and/or low confidence:

I’m not an exercising person truthfully… I used to like tennis…but other than that I’ve never had any exercise …the atmosphere felt funny…it would be nice if you’ve got somebody to mix with when you’re there because otherwise what’s the point in going. (Paula Rushton, white, female, 60–69, low attendance).

Uptake was important to people who believed the possibility of reduction of pain or discomfort or low mood and loneliness or an opportunity to ‘get out of the house’ represented in Fig. 4 as psychological and social motivators for attending. Getting out of the house and to exercise services was important for 72% of all participants especially high attenders. Many participants spoke about boredom in spending time at home and attending the exercise sessions was something new to look forward to during the week. People who benefitted most from the opportunity to attend exercise services and change their routine were retired, unemployed and/or suffered from mental and physical symptoms. Men especially spoke of wanting to get out of the house more since stopping work:

…it was getting me out of the house twice a week and getting more routine. (Marcus Giometti, white, male, 70–79, high attendance).
I wanted to get out of the house . . . to improve my health and to you know, just socialise more as well. (Malcolm Leedale, black Caribbean, male, 60–69, high attendance).

What is good about the scheme is it will keep people busy who are not doing something, who are like me, retired now. (Mary Tennant, Black African, female, 60–69, non-attendance).

Support

Support was a critical factor associated with both uptake and adherence. Findings were based on the accounts of all groups of participants and nominated supporters of attenders. Support is shown in Fig. 4 as being central to overcome negative exercise identities and to increase confidence and importance to exercise and as impacting on perceived benefits of attending and benefits of uptake. Four different types of support emerged, these were (i) monitoring, (ii) providing information, (iii) practical support and (iv) emotional support. A diagrammatic representation of the types of support, the function that they played and who was most likely to provide it can be found in Fig. 3.

Monitoring was primarily spoken of in terms of feeling supervised by the exercise professional at the exercise services. Formal monitoring at exercise services included monitoring for safety, monitoring to ensure progression and also watching and giving assistance to the individual while they are exercising. It is the latter form of monitoring that the participants most valued. Monitoring was particularly welcomed by participants with pain or discomfort, who were not confident to exercise unsupervised, were unsure about how to exercise correctly or required regular encouragement and attention.

...took me through all the um equipment, somebody would come and say to me ‘No, no, no, don’t do that’ you know—‘Follow your programme’. Don’t tend to rush things up, you know you get there some day. (Hannah West, black African, female, 40–49, low attendance).

The ‘providing information’ type of support was of most benefit where it was perceived as personalized.
It included the provision of information about their condition and how to manage it effectively through exercise and diet. Feedback on exercise progress from exercise professionals and feedback from medical professionals were also types of information felt to be supportive. Information served to reassure, increase confidence and as a way of gaining self-awareness. Support in the form of information was provided by friends and family, occasionally by referring medical professionals and most frequently by exercise instructors (as shown in Fig. 3). The instructors encountered by high attendees have been praised as being knowledgeable and spending time to explain things to people, which resulted in trust and rapport and contributed to compliance:

They talk about, you know, how your illness is and how the body works. (Malcolm Leedale, black Caribbean, male, 60–69, high attendance).

Obtaining relevant information from a credible and trustworthy source was powerful. Advice, guidance and information occasionally came from family or friends who were viewed as knowledgeable in medical matters or exercise. Information about the potential medical benefits and information about the availability of the exercise service from the medical profession were useful to encourage initial engagement.

‘Practical support’ included assistance in getting to the venue, exercising with a friend or family member and assistance with information provided by medical or exercise professionals. Nine of the fourteen nominated supporters spoke of providing practical support. When looking at the different types of support received by high or low attenders, the most obvious difference between them was that high attenders received more practical support and relied more on that support. For these high attenders, their supporter also played an important supportive role in other aspects of their lives. All of the people who nominated a supporter had more than one chronic condition and experienced unpleasant symptoms at the time of the referral. Supporters often provided practical support and participants considered their support to be important and in some cases essential for their attendance. Nominated supporters were much more likely to be a partner or a friend of a similar age or a younger relative and were most often the person the participant lived with and always someone who they felt close to.

‘Emotional support’ demonstrated approval for exercising through encouragement (including providing information) and reassurance.
And she says things like ‘Well you’ve got a bit of life nowadays’. (Thambi Ngema, black African, female, 60-69, high attendance).

It resulted in increased confidence to exercise, a sense of well-being from a feeling of being cared for or receiving attention, which could be felt as a benefit from being part of an exercise group, feeling welcomed and feeling comparable to others. Emotional support was mostly provided by close friends and family but was also provided by instructors:

…[the instructor had] genuine interest in the individual’’ (Philip Pryer, white, male, 80–89, high attendance).

Nice to be asked how my hospital appointment went. (Lilly Ashworth, white, female, 50–59, high attendance).

Emotional support for high attenders was more likely to come from someone who was well known by the participants and who was accessible. People with close relationships with one or more individuals were more likely to receive emotional support than those who were more socially isolated. Where emotional support was perceived to be unavailable from a friend or family member, attenders relied on support from instructors.

The factors associated with uptake were (i) presence of psychological and social motivators for attending, (ii) availability of support (also see Fig. 3) and (iii) overcoming negative exercise identities (see Fig. 1) through support (see Fig. 3). Stopping attending was associated with low levels of support and not feeling benefits of attending such as those shown in Fig. 2. Non-uptake occurred where importance or confidence was low or negative exercise identities were not overcome, in association with lack of support. Adherence is most strongly associated with perceived benefits of attending and support.

The main findings are (i) social and cultural norms can conflict with exercise identity and willingness to exercise, (ii) exercise identity influences willingness to attend, (iii) perceived importance of changing an uncomfortable social or psychological situation has a positive influence on uptake, (iv) the availability and use of appropriate support has a positive influence on willingness to attend and (v) group cohesion and support have positive effects on perceived benefits of attending. Taking these factors into account in the design and implementation of exercise services is likely to encourage uptake and adherence to exercise and physical activity.

Existing social and cultural identities were given as reasons not to attend in the absence of support and positive role models. The influence of the person’s social environment and beliefs about what others think on intention to perform a behavior is an element of the Theory of Reasoned Action [21]. However, the existence of social and cultural identities that are not congruent with the principle of exercising have not previously been explored for people with chronic conditions from different ages, genders, ethnicity and attendance levels. Other qualitative research has found that women from ethnic minorities in particular have low levels of support to exercise where exercise is not part of a cultural identity [22–25]. In this study, concerns about being less capable than others based on perceived differences in age gender or ethnicity were barriers to exercising. Burgoyne et al. [26] demonstrated that sedentary white men and women felt
they lacked competence and confidence in a gym environment and were concerned about being seen by others. In the current study, a negative exercise identity and a lack of realistic role models and support to exercise meant both men and women had concerns about their capability to exercise, which influenced non-uptake (as shown in Fig. 4). It was only where they were willing to challenge their view of themselves, and with the help of support, that they might gain confidence to attend. The need for support and the influence of others is incorporated into some health behavior models. The Transtheoretical Model [4] includes ‘helping relationships’ as a process of change in behavior and is reported to predict transitions from preparation to change to action stages and from action to maintenance [4]. However, the current study highlights the importance of support during earlier stages of contemplation as well as during action stages. Bandura’s Social Cognitive Theory [3] and Rosenstock’s [27] later version of the Health Belief model incorporate self-efficacy. Self-efficacy can be influenced by personal experience of performance attainment, imitation and modeling and verbal and social persuasion [3]. There is evidence for the importance of increasing self-efficacy in exercise interventions [5–10] but samples in these studies have been insufficiently inclusive. Previous studies are mainly quantitative, limiting the insight gained into the types and sources of support most useful to participants.

Fig. 4. A new model of exercise uptake and adherence for people with chronic conditions. The model in its entirety represents the experiences of all respondents. Each arrow in the model represents a common relationship for some of the respondents, at a particular time. Support is seen in the centre of the diagram influencing attendance through importance and confidence and directly influencing attendance. The right side of the diagram shows the influences of exercise identity through support and importance. The left side of the diagram shows the influence of psychological and social motivators for attending on importance and confidence and modifiable through support. The lower part of the diagram shows the cyclical relationship between attendance and perceived benefits of attending.
and who role models are most likely to be. This study provides additional insight about the role of different types and sources of support in overcoming concerns about exercising and demonstrates that concerns about exercising are not only performance related but are also identity related.

The importance of overcoming negative exercise identities to take up exercise has a direct implication for exercise services both at the referral stage and at the service delivery level. It is recommended that future exercise services make participation appear non-threatening to those with existing dominant identities by demonstrating that people of similar age, gender, ethnicity and ability already attend services. This could be achieved by introducing potential attendees to existing group members during the initial consultation or describing successes and perceived benefits of attending of previous attenders with similar demographic characteristics.

The new model shows that wanting to improve poor mental and physical health has a powerful influence on the level of determination to attend and adhere to exercise services. This study showed that the desire for change in psychological and physical health was more urgent in high attenders and less in people who stopped attending or did not attend. This is consistent with the Health Belief model [27]. However, the current study showed that the perceived benefit of attending and continuing to attend was not necessarily related to exercise per se but to the social benefits of attending.

Many positive effects on mental health have been found with exercise participation, such as reduced loneliness [24], increased energy and feeling better [9, 28], opportunities to meet people and social interaction [13, 14, 26, 28–30] feeling more purposeful [13, 28], managing mood associated with disability [31], taking control [25, 30] and self-acceptance [13]. This and the new evidence highlights the need for promotion of potential social and psychological benefits of joining an exercise scheme as well as physical health benefits, this is important for those who are non-symptomatic and/or those who attach low importance to medical ‘benefits’ such as weight loss or improved diabetic control. The social and mental health benefits of attending should be incorporated into literature promoting exercise services and during face-to-face consultation with participants. To maximize social benefits, services should encourage social interaction between participants both during exercise, for example by encouraging participants to exercise in pairs or in small groups, and during any refreshment breaks.

The need for support and the availability of support from friends and family or from the exercise service is a key factor for adherence and important for buffering stress. Many people who experienced pain or discomfort or low mood took up exercise services and this was largely due to emotional support from people that made them feel cared for. This helped participants to challenge some of their anxieties about attending.

The current research found that the people who were least affected by their negative situation and those who had low agency to control their situation were less motivated to change by starting to increase activity levels and therefore did not engage with support. Understanding as well as believing the potential social and psychological benefits of attending exercise services was shown to be important and so exploring this with participants before they start attending could be incorporated in future interventions to see if this encourages attendance. Several interventions have achieved good attendance by using motivational interviewing techniques and exploring the benefits of attending versus the disadvantages (decisional balance [4]), with the aim of reducing ambivalence about attending [14, 31, 32], and this is recommended in future interventions.

Other qualitative studies have shown overwhelmingly that support from exercise instructors is important for attending [13, 14, 26, 30, 34] and that support from friends and family or spouse [35] is important especially among women [16, 22, 25]. The current research examined the sources of support both inside and outside the exercise environment and the types of support that were most useful. High attenders spoke of having a number of different types of and sources of support.

The four most useful types of support were emotional support, practical support, monitoring and providing information. These are similar to common
operational definitions of social support: emotional support, instrumental or tangible support, informational support and appraisal support [36]. In this research, emotional support was also encompassed in the other types of support identified in providing and demonstrating care and empathy. Practical support is similar to ‘instrumental support’ or the provision of tangible aid but in the current research, there was a strong element of feeling loved by people providing practical support. Information support is provided during a time of stress [37, 38], in the current research, information support served to assist with practical ways of coping with their condition and to reassure during exercise. Appraisal support [37] or affirmation support [39] is similar to ‘monitoring’ which was sometimes associated with affirmation and praise, but in this research was more associated with feeling watched for safety during exercise and receiving attention. Exercise services should assess an individual’s need for support (confidence, exercise identity) and their existing support network, in order to provide regular structured support in the form of care and encouragement during exercise and in between sessions [14] and identify other support opportunities, such as through GPs, family [35], carers or through other people in the exercise group. To encourage support from outside the exercise service, friends and family can be invited to attend the initial consultation with potential participants.

Exercising among other people with similar conditions was a source of feelings of positive self-worth and optimism and was an influence on adherence. Comparison with other people in the group was an important source of information about their own health and level of physical ability and resulted in increased hope, reduced anxiety about their condition and life situation and confidence to exercise or be physically active. Previous studies have found similarities and comparison with other people to reduce apprehension to exercise [14, 28, 29]. Gains in confidence to exercise by attending are represented in the model in Fig. 4 as connected to scheme attendance and in more detail in Fig. 2. A sense of group support and a supportive environment have been illustrated in previous studies as important to attendance [14, 28–30, 34]. People who were able to identify similarities to others in the group were more willing to continue their attendance at exercise services. Feeling different to others who attend exercise services and not fitting in was also related to age, gender and cultural and social identities and low attendance. To help prevent low adherence for this reason, it is suggested that participants could be helped by instructors to recognize similarities to rather than differences from others in the group.

There was some difficulty in recruiting young men and women and especially young black men. These groups would benefit from further research to explore their barriers to taking up exercise services. Also, the scope of the study allowed inclusion of only the three dominant ethnic groups in the local area, and medical information on participants was not collected from exercise services and so exercise uptake or adherence could not be analyzed according to diagnosed chronic condition(s). However, this study was conducted using rigorous qualitative methodology, and the model has been carefully checked using a large quantity of very rich data from a diverse sample, adding to the quantitative research that currently dominates the literature. The findings add important knowledge to the existing models of exercise behaviors and have direct implications for exercise promotion and delivery for people with chronic conditions.

Funding

‘Guy’s and St Thomas’ Charity’ (R050710), an independent charitable foundation in London, UK providing a variety of competitive grants, see http://www.gsttcharity.org.uk/.

Acknowledgements

Professor Ann Taket was the principal investigator on the grant, which supported the doctoral studies of Dr Claire Pentecost, lead supervisor Professor Ann Taket. We would also like to acknowledge the other two supervisors of Dr Pentecost’s, Dr Jo Bowtell and Dr Mehul Kotecha. We would also like to thank the anonymous referees for their very helpful comments.
Conflict of interest statement

None declared.

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