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# Health Education and Activity – Lessening The Inequalities in mental health (HEA – LTI mental health)

Georgia Richmond, Conor Kenny, Javed Ahmed, Lucy Stephenson, Jamie Lindsay, Patrick Earls, Donncha Mullin, Howard Ryland

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CK and GR contributed equally to this proof.

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South London and the Maudsley NHS Foundation Trust

**Correspondence to**  
Conor Kenny ckennybe@gmail.com

## ABSTRACT

Patients suffering from mental health illness have considerably more physical health disease burden than the rest of the population and are more likely to die 10 to 20 years younger compared with their peers. Diabetes, cardiovascular and respiratory disease have been recognised as contributing factors to premature death. Furthermore patients with severe mental illness undertake lower levels of physical activity.

The aim of the project was therefore to address the inequalities in physical health that affect patients with mental health illness through designing and implementing a sustainable, transferable, patient-centred education and activity intervention.

The objective of the project was to increase patient motivation to change behaviour as a result of physical health interventions by increasing patients' physical health understanding, motivation to change their physical health behaviour, motivation to do exercise and by reducing their anxiety.

The method used was a prospective cohort study in four eighteen bed psychosis inpatient units. The units were across two large London hospitals in one Hospital Trust involving male and female inpatients with a range of mental health issues.

The intervention was comprised of two components. The first component was a weekly 45 minute teaching group designed in collaboration with patients focusing on the key domains that affect the physical health of mental health patients. Four discussion domains (heart health, diabetes and weight, smoking and lung disease, cancer screening and substance misuse) were undertaken, with each cycle lasting four weeks. The second component was a weekly 45 minute exercise group ('normalisation activity') in collaboration with patients and the multidisciplinary team.

The intervention was evaluated at the end of each cycle and four cycles in total took place.

Weekly pre and post intervention measures were undertaken comprising of a self reported change in understanding, motivation to change physical health behaviours, confidence to change, anxiety and motivation to exercise.

The result was a 26% improvement in self-reported understanding across the four domains following teaching. Furthermore patient anxiety reduced by on average 35%, self-reported motivation to change increased by 20%, motivation to do exercise by 26%

and confidence to change by 16% as a result of the intervention.

The authors conclude that a collaborative approach to education and activity between the Multidisciplinary Team (MDT) and service user results in sustained improvement in understanding of physical health, motivation to change behaviour and to do exercise. It also results in improved confidence and reduced anxiety.

## PROBLEM

Individuals with severe mental illness (SMI) are at greater risk of physical health problems.<sup>1-2</sup> Mortality at rates of two to three times that of the general population translates into a reduction in quoted life expectancy by approximately twenty years.<sup>3-6</sup> Potentially treatable cardiovascular, respiratory, and metabolic diseases pose the greatest risks.<sup>3-4</sup> People experiencing SMI are less physically active and have higher rates of co-morbid substance misuse, and both factors are associated with poorer health.<sup>7-8</sup>

To identify where improvements could be made to the current physical health care of patients with mental illness, a flow diagram was created. This provided an overview of all interventions taking place to address these issues. From this it was identified that current interventions focus on improved monitoring of metabolic parameters by health services. With the research evidence suggesting poor health related to reduced activity, a clear opportunity was recognised to widen the focus of interventions to provide physical health activity and education.

## BACKGROUND

Individuals who experience severe mental illness (SMI) have a ten to twenty year reduction in life expectancy, compared to peers with no episodes of treatment for MI (mental illness), with evidence suggesting a

multi-factorial reason for this discrepancy.<sup>4-6</sup> One potential cause for lower life expectancy is the high risk of metabolic disease associated with antipsychotic use, and in addition a person with SMI who has metabolic disease is less likely to be diagnosed and receive treatment.<sup>9-11</sup>

The access and utilisation of physical healthcare services by these individuals is a particular concern. Those with SMI have twice the risk of diabetes mellitus, treble the risk of hypertension, and treble the risk of suffering a fatal myocardial infarction, compared with members of the general population.<sup>12-14</sup> There have been considerable advances in healthcare which have led to a reduction in cardiovascular disease related mortality in the general population over the past two decades. However, this improvement has not been seen among patients suffering with SMI. Beyond the inequality in health outcomes, the financial implications on the health care system are significant. A 2012 report by the 'King's Fund' suggests that funding for the management of co-morbid mental and physical illness raises overall healthcare cost per individual by 45%.<sup>15</sup>

One risk factor for poorer physical health is that people with SMI are less likely to engage in physical activity. In the UK, almost one-third of those with SMI report no regular physical activity.<sup>16</sup> Richardson et al suggest that the lower levels of physical activity seen in this group partly explain the increased mortality.<sup>17</sup> This indicates that interventions promoting physical activity as a strategy to target weight reduction and reduce cardiac risk factors would be beneficial in this group.<sup>18, 19</sup> Moreover, research supports physical exercise as a moderately effective treatment for anxiety and depression.<sup>20</sup>

Increasingly, government policy encourages clinicians to engage in quality improvement projects to enhance patient care and wellbeing.<sup>21, 22</sup> These projects emphasise the importance of sustainability, accessibility and transferability. It is recognised that the inpatient multi-disciplinary team is ideally placed to act on the opportunity presented by an inpatient admission. Implementation of ward based lifestyle modification programmes can capitalise on this. By comparison their community based colleagues<sup>23-25</sup> are better placed to nurture and sustain any change achieved following discharge. It is widely documented that lifestyle modification can reduce cardiovascular risk factors and metabolic disease.<sup>26, 27</sup> Research has shown that small group and individualised lifestyle interventions related to dietary modification are effective at improving healthy eating and reducing weight gain in patients with schizophrenia.<sup>28-30</sup> Furthermore, a small body of evidence points to the effectiveness of wellness classes in improving physical function and general health scales.<sup>31</sup>

Considering this body of evidence and experience gained from working on inpatient wards, the medical team based in a large London psychiatric Hospital Trust designed a quality improvement intervention which comprised of an inpatient education group and activity

session. The aim of the project was to improve patients' understanding and motivation to improve their physical health through education and activity (See supplementary – Process flow diagram of the patient's journey created to identify opportunities for improvement in physical health).

## **BASELINE MEASUREMENT**

The project took place across four inpatient units across two large London hospitals in one NHS Foundation Trust. This Trust provides the widest range of NHS mental health services in the UK. The units consisted of three single sex male wards and one female sex inpatient ward with a very wide range of mental health issues, ages (18-65 years), ethnicities, religions, socio-economic statuses and educational backgrounds. The units consisted of a continually fluctuating ratio of patients there informally or under section of the Mental Health Act 2005.

All inpatients were invited to attend their weekly ward sessions. The only exclusion criterion was for patients who were deemed, by joining, to become a risk to themselves or others. Staff for each ward included nurses, doctors, administrative, an OT and one physiotherapist per hospital.

This intervention sought to empower patients to identify, address and improve their own physical health behaviours with better understanding and motivation of physical health topics through education and activity sessions. To establish a baseline with which to assess improvement, each participant's own self-reported understanding and motivation scores were collected at the beginning of each session. Baseline measurements were gathered using a Likert scale in a participant questionnaire. The same questionnaire was then given to the participants at the end of the session to compare any change from baseline.

## **DESIGN**

As discussed the aim of the project was to address the inequalities in physical health that affect patients with mental health illness through designing and implementing a sustainable, transferable, patient-centred education and activity intervention. The intervention was designed by members of the medical team following reflection on experience and literature. Regular re-evaluation and improvements were made using the Plan Do Study Act approach in multi-disciplinary focus groups.

Inpatient education sessions were designed to cover four educational topics and provide weekly activity sessions. These sessions were divided into cycles. Each cycle was composed of four weeks. Each week one of the four topics was covered. Four cycles were completed in total. Cycle one was undertaken by the first Foundation Year 2 (FY2) doctor lead, based on a male acute inpatient psychosis unit consisting of eighteen beds. Cycle two was undertaken on the same ward by the second FY2 doctor

after a one week induction period. Cycle three was completed after cycle two by the second doctor. At that time it was also initiated on a further eighteen bed male inpatient ward in the same hospital by a third FY1 doctor. A one week break occurred during induction of three new doctors who then ran the fourth cycle across three wards in the same four week period. These three wards included an acute eighteen bed female ward in the same hospital, and a further acute eighteen bed male inpatient ward in a different hospital.

Each week of each cycle followed the same structure of a 45-minute exercise group and a 45-minute teaching group. Each week focused on one of four topics; heart health (blood pressure and cholesterol), diabetes and weight, smoking and lung disease and cancer screening and substance misuse.

Education sessions took place on the ward and were co-led by the Foundation Doctor, Occupational Therapist and Ward Activity Coordinator. They followed a set plan. There were objectives for each education session. The education sessions were patient-led, with the session facilitator commencing with open questions about the topic and then integrating the main objectives for that session into the discussion.

Activity sessions took place at a suitable exercise space within the hospital or local grounds. Activities included football, netball, badminton, walking, stretches and were decided through discussion between the MDT and patients.

Patients were made aware of the exercise or activity programme during the morning ward meeting of patients and MDT. Participants were then gathered by MDT members visiting each patient on the ward, outlining the session's topic or activity, its aims, benefits, length and answering any questions before asking whether they would like to join.

This simple design was chosen for several reasons. Firstly to encompass key topics suggested in research to be fundamental to improved quality of life and life expectancy. Secondly to cover topics important to patients as advised by patient feedback. Thirdly to be realistic about the inpatient group's wide variation in mental state, inpatient admission length and existing understanding and motivation. Lastly to allow regular re-appraisal of the intervention through PDSA analysis.

## STRATEGY

The outcome measures in the questionnaires that were consistently measured across the four cycles were percentage change in understanding of the subject covered and the percentage change in motivation to improve their own physical health behaviours. Confidence to change, motivation to exercise, and anxiety were also measured at certain points but these outcomes were not measured across all cycles. The outcomes measured were simplified in order to maintain accurate data collection across cycles and between doctor handovers. The absence of an appropriate and reliable anxiety

measurement scale also contributed to this decision. On this basis these results are only briefly discussed here.

All data collected at the same time across all wards has been collated. For example in cycle three, two wards participated in each week's session of the cycle. Therefore the participants' questionnaire data from both wards was combined for the analysis for cycle three. Similarly, for cycle four, three wards were undertaking the cycle concurrently and so the participants' questionnaire data was again combined for analysis.

As we were unable to track individual patients across any more than one session, as discussed in limitations, we have analysed the results as per respondent. A respondent equals one patient who attended one session. The range of respondent numbers for each cycle are; 5 -11 respondents in cycle 1, 2 - 5 respondents in cycle 2, 3 - 5 respondents in cycle 3 and 10 - 12 respondents in cycle 4.

Of the main outcomes assessed, the first question about understanding was split into either four or five subsection questions based on the topic discussed, for example 'I understand how smoking affects my health'. The respondent rated their understanding of the subsection item on a 0-5 Likert Scale, with 0 being no understanding and 5 being full understanding. The second question asked the respondent to rate their motivation to improve physical health on a 0-10 Likert scale. Again with 0 being no motivation and 10 being full motivation.

These raw scores were converted to pre-session percentages and post session percentages finally giving us the percentage change per category.

The project used the PDSA method to continually reflect and react to issues. There were four PDSA cycles in total. [Figure 3](#) outlines each cycle's aim, observations, analysis and subsequent changes to be implemented. Fundamental to the PDSA study phase, ensuring the project continued to meet its aims and objectives, focus groups were included in the initial planning phase and then at the end of each cycle. The focus groups comprised of members of the MDT; the Foundation Doctor, ward nurses, HCAs, the activity coordinator and the ward registrar. An open space was encouraged for individuals to suggest issues, concerns, positives and improvements. During these the data collected would be analysed, MDT members' and patients' opinions sought, ideas for improvements collected, ways to implement these discussed and a decision on updates to the intervention going forward made. Details of these changes and the time of their implementation can be seen in the PDSA diagram, [Figure 3](#). Through implementing these changes project leads sought to encourage ongoing efficacy, sustainability and transferability. Several aspects of the design resulted from feedback and discussion in focus groups. As highlighted in [Figure 3](#) these included introduction in cycle 2 of a topic-based interactive education booklet and use of the pre-existing Trust Smoking Cessation Team, in cycle 3 addition of nursing assistants to maintain timings and provide greater participant

support and further updates were made to the content of the education sessions. Simplification of the questionnaires and outcomes measured, techniques to optimise patient recruitment and an update to the education booklet occurred in cycle 4. A timeline of the introduction of these changes and their impact can be seen in the run chart graphs in Figures 1 and 2.

## RESULTS

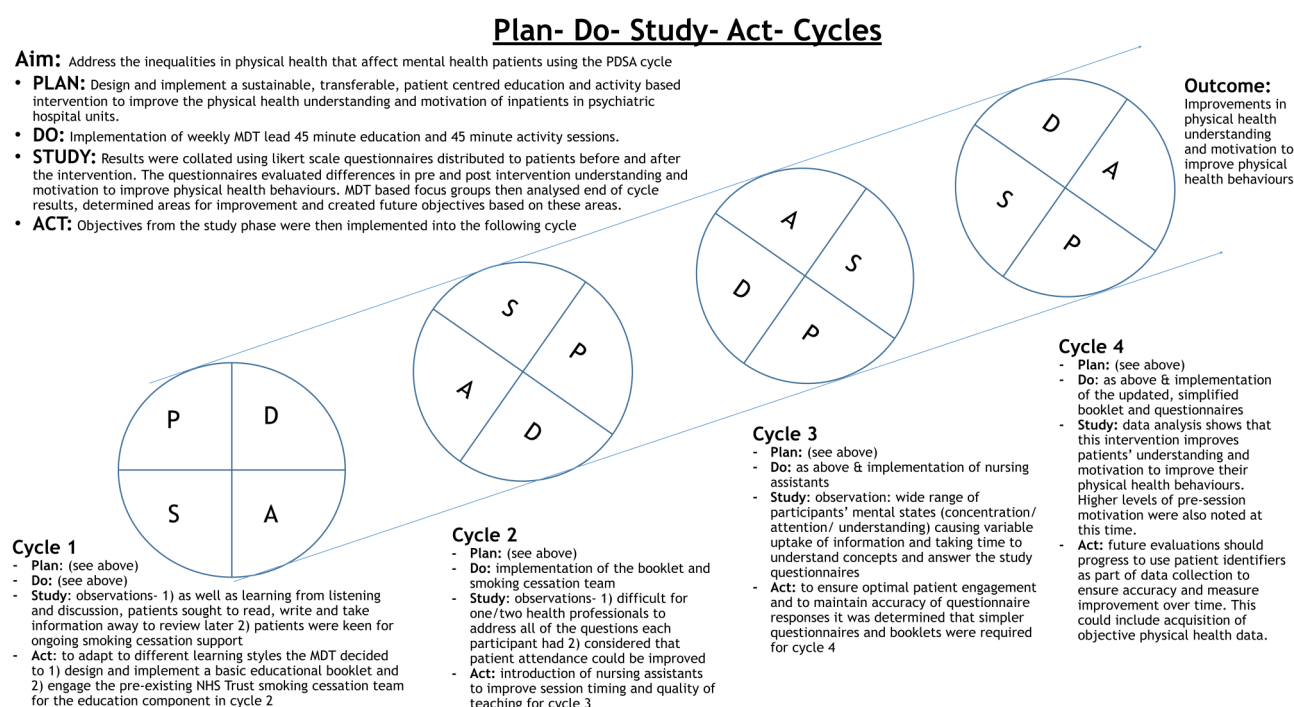
A table of results is seen in Table 1.

Regarding understanding of subject, the graph in Figure 1 shows a clear absolute percentage change improvement in understanding after nearly all sessions, with the average increase in understanding per session over the four cycles (sixteen weeks) of 26%. For change

in motivation to improve physical health behaviours, Figure 2, also shows a trend of increased motivation after each session and an average absolute percentage increase of 20%. These changes are consistent across all 16 weeks and through change in project leader and Foundation doctors.

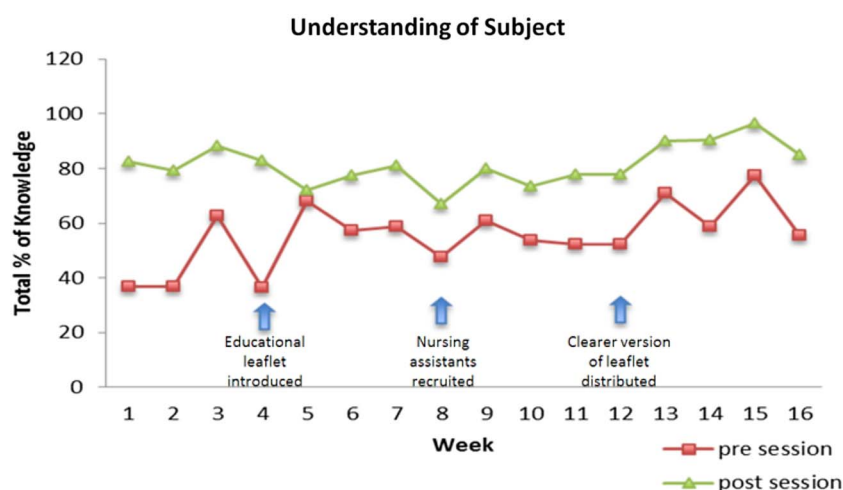
It is also worth noting that there appeared to be higher levels of pre session motivation percentages in the later cycles of the project. Whilst each cycle consisted of different participants, there did appear to be a general increase in motivation after each cycle. This could possibly reflect improvement on a ward level, facilitating increased motivation for change of patients through increased engagement of staff.

Anxiety, confidence, and motivation to do exercise were also measured but not uniformly across all cycles as



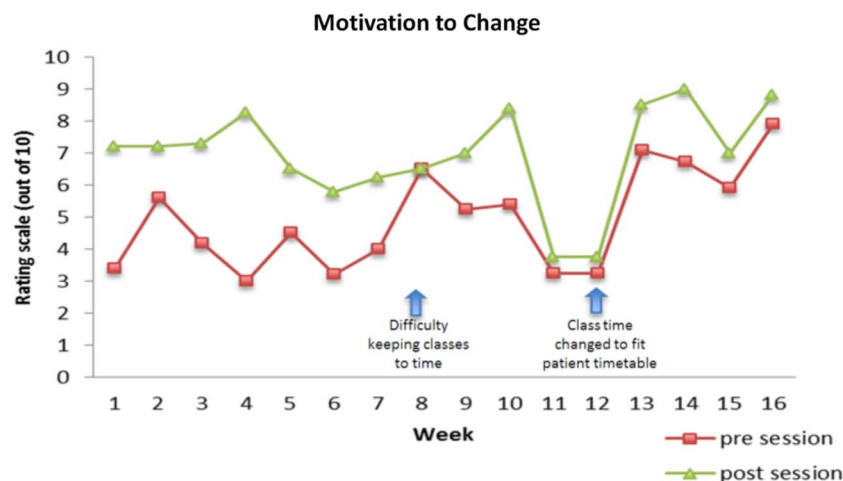
**Figure 1** Overview of PDSA cycles and changes implemented

**Figure 2** Change in understanding of subject by respondents before and after education sessions over time





**Figure 3** Change in motivation by respondents before and after education sessions over time



**Table 1**

	Pre %	Post %	Change %
Motivation to improve physical health behaviours	49.47	69.53	20.06
Understanding of topic	55.41	81.34	25.93

The table shows an average of all respondents' self reported percentage scores, measured by questionnaires, of motivation to improve physical health behaviours and understanding of the session topic before ('pre %') and after ('post %') each session and the subsequent average percentage change ('Change %') in motivation and understanding

with the other outcome measures. Anxiety measured only in cycle one displayed a decrease of 35%, confidence to change measured in cycles two and three only showed an increase of 16%, and motivation to undertake exercise measured in cycles three and four showed an increase of 26%.

## LESSONS AND LIMITATIONS

This was a practical project involving real patients in real wards. The authors have identified several qualities, lessons and limitations of this intervention. These include its ability to respond in a realistic time frame to problems, its sustainability, transferability, improvement in patient care and the outcomes measured, as well as the difficulties experienced with optimising sample size, the generalisability of results and its ability to measure objective improvements in physical health outcomes.

Education groups provided time and a platform for opening up which proved to be a collaborative space enabling staff to get to know patients better and in a different way. Patients often felt able to discuss challenges and struggles they faced that MDT members had not previously been privy to. Important insights were gained during the project as the mental state of patients could be gleaned from their group engagement. This enabled their ongoing care to be more patient centred.

Sustaining the project occurred in several ways; maintaining staff engagement through good communication, focusing on this being an MDT intervention and engraining the project into the culture of the ward were key. Also beneficial were the weekly frequency and regularity of sessions, the almost daily discussions with staff and patients about the importance of the project. Ongoing engagement through formal (e.g. discussion in MDT meetings) and informal meetings helped to maintain focus. As the sessions ran over multiple weeks the intervention became more ingrained in the culture of the ward; nurses became used to helping invite patients to attend and patients came to expect the sessions. Physical health leads for the Trust were approached and a presentation given at the Trust physical health conference to engage wider and more top down support.

The project was found to be transferable, overall surviving four cycles and a change in FY2 doctor lead. This is essential in the context of rotating doctors. Transferability was achieved in multiple ways – a short presentation was given to the incoming doctors at their rotation induction day followed by an individual or small group explanation to interested parties by a member of the HEALTHI organisation. Regular encouragement and advice was given to new doctors from the pre-existing HEALTHI team and also from OTs on the wards who had already been involved in the intervention. Formation of a "Whatsapp group" (a group texting service) between older and newer HEALTHI members optimised ongoing technical support. Used as a visual aid the booklet was useful for maintaining sustainability, standardisation and delivery of each session. It also proved useful in encouraging doctors to see that even with the time constraints of the job, the booklet could reduce the time required for prior organisation by use as a template and guide for each session.

It was cost effective as very few resources were needed, the main resource being the time of the healthcare professionals and the patients.

The main limitations of the study are the outcome measures. Non-validated questionnaires were used owing

to existing ones being unsuitable to reflect the changes to be measured. Although the same questionnaires were used pre and post sessions to increase consistency and to assess change against a self-reported baseline, the reliability of this measure can be influenced over time by fluctuations in the reporting participant's mental state. The validity of the outcome measures were influenced by the reporting participant's interpretation of the terms and questions. Due to the nature of the patients' illnesses with many suffering from short attention spans and difficulty understanding questions, the priority was to devise simple and short outcome measures for each specific outcome. This contributed to the design of questionnaires which were further developed across each cycle.

Improvement in physical health measurements are clearly part of the wider aim of this project. Measurements of change in understanding and motivation are proxies for a change in physical health measurements, quality of life and life expectancy. As discussed literature recognises that patients with mental illness would benefit in multiple ways (physically, mentally and socially) from doing more exercise and changing lifestyle behaviours. Further it is recognised that understanding is a necessary step in the cycle to achieve sustained change.<sup>39</sup> Whether the HEALThI team should gather data for analysis of improvements in physical health measures resulting from this intervention was seriously considered during the design phase of this project. Further consideration was given to using this intervention to achieve physical health CQUIN targets for the Trust - to link improved patient care with greater economic sustainability. Yet there were feasibility issues with this. The duration of inpatient stay - as well as being highly variable (anything from 24 hours to over 6 months) - was not thought to be long enough in many cases for clinically significant changes in objective physical health measurements to occur in a sufficient number of patients. The education sessions provide a further reminder to check that CQUIN target measurements had been recorded yet time constraints meant this could not happen during sessions and no formal assessment was made of the efficacy on this. This intervention chose to focus instead on empowering patients with physical health understanding and motivation to make change even after discharge. A number of attempts were made (through meetings, email exchanges and training) to initiate lines of communication with Community Mental Health Teams (CMHTs) to continue the education and understanding after discharge. Unfortunately the complexity and the high number of different CMHTs in this Hospital Trust's catchment area together with reported difficulties engaging patients in the community made this incredibly difficult. It was also time consuming and although worthwhile was beyond the scope of this intervention and its aims and objectives.

The small sample size means that the changes were not assessed for statistical significance. The reasons for

small sample size may contribute to sampling bias and generalisability of results. Engagement of patients was a challenge and several reasons for non-participation were identified.

Attendance each week varied and usually at least one participant did not fill in the questionnaires. Participation in the project was entirely voluntary, some patients did not want to partake, some were too unwell to participate or participation for some was deemed unsafe. Risk of violence or absconson was mitigated by individual risk assessments prior to the session through group discussion between MDT members and having these team members present during classes. This could reduce the efficacy of the intervention by not reaching some of those who need it most and it could reduce the generalisability of the results to be applicable only to interested, relatively well individuals. Yet as a patient centred intervention in reality it would often be a combination of these factors, specific to the individual, that might preclude them from joining, rather than one factor alone. For example an interested patient suffering from mania joined and engaged very successfully. Should it have occurred that they became agitated to the point of jeopardising the group or its safety then they would have needed to be removed. In reality this did not occur. Another example was an individual suffering from severe catatonic schizophrenia who would not speak but would sit, listen and write occasionally if not engage with discussion. This interaction with others was thought to be highly positive and the information imparted and benefits gained not measurable in this instance.

This is likely to mean that the results are still generalisable to a general adult psychiatric ward which caters for patients with a similarly wide variety of ages, cultures, ethnicities, educational levels, mental illnesses and mental states.

Several strategies were tried and adopted to improve engagement. Moving the session to a time where more patients were on the ward (which tended to be mornings before leave) proved useful (see figure 2). Where the MDT thought the sessions could be useful for a patient, their attending the group might be discussed with them during ward rounds as part of their management plan. On the day of the session it would be discussed in the morning meeting with all patients as one of the day's activities; they were presented as fun, active, interesting, educational, interactive and friendly groups for all levels. In the exercise classes patient motivation was improved by showing flexibility around varying abilities and energy levels, as well as letting patients decide on what activity to do. The educational sessions tried to cater for all levels of interest and ability by having several nurses and assistants available to give individual help and attention. The booklet proved useful here too because it provided something tangible for patients to own and engage with whilst the nurse, assistant or doctor was busy helping another patient.

The data shows limited improvement in outcomes gained from the booklet and the additional staff implemented secondary to the PDSA analysis. We acknowledge that continued improvements could be made to the booklet and the training of staff in delivering physical health care advice. We understand the latter is slowly being addressed through governmental health initiatives. Other reasons have been identified too. It is thought that with such a variety of patient educational backgrounds, mental state and language- delivering a session to suit each individual was more difficult, leading to reduced improvement gained per respondent. The sample size, as discussed, is likely too small to show a significant difference. Given that data was not collected per patient over time (rather per respondent per session) it is not possible to assess whether there was a cumulative benefit of attending more than one session nor whether there was an improvement with change in mental state.

This too affects educational continuity for patients as well as in the data collected. Continuity was poor owing to the real life nature of this intervention with new admissions, discharges, leave and changing mental state all accounting for this. Looking forward improvement could be made by assigning a patient number to follow their outcomes across time and even different admissions. However the booklet did provide some continuity – as many patients might be re-admitted, their familiarity with the sessions was notable and they could continue with sessions they had not previously done.

It is also suggested that there are benefits to the changes made beyond those expected to improve the outcomes measured. Improved sustainability results from easier handover between doctors using the booklet. It is easier too for assisting staff (whether nurses, OTs or auxiliary staff) to help the patients if the information is in front of them. Consistency and homogeneity between sessions were also maintained. Reduced preparation time was required prior to each session because the booklet could be used as a tool and session guide. The visual and interactive element of the booklets engaged patients in a different way which is important for addressing individual learning styles. The patients could take the booklet and their annotations away and revisit the information later. There were also clear safety implications of having a higher staff to patient ratio.

## CONCLUSION

In conclusion, this physical health education and activity intervention has shown to support an increase in both understanding of key physical health topics and motivation to improve physical health behaviours. Through this intervention we have identified several other factors which have resulted in improved patient experience and delivery of care by the MDT. Ongoing the primary aim will be to consolidate and sustain the intervention. Beyond this it will be to establish connections with

Community Mental Health Teams to capitalise on the improved understanding and motivation in a setting where longer term support and encouragement can be given to continue this change.

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**Declaration of interests** None

**Ethical approval** Approval for the HEALTHI project was granted by the Psychosis Clinical Academic Group (CAG) Audit committee at South London and Maudsley (SLAM) NHS Foundation Trust, London UK. The Health Research Authority outlines that further ethical approval is not required for quality improvement projects. Approval was also sought from all ward MDTs before the project was implemented. Although participation in the project was encouraged it was voluntary and participants could leave sessions at any time. If there was concern about a patient's capacity to consent to participating in the project or any risk concerns this was discussed with senior members of the medical team. The psychosis CAG covers the SLAM area including The Maudsley Hospital, Southwark, Lambeth, Lewisham and Croydon.

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