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Queen, Martyn, Crone, Diane ORCID logoORCID: https://orcid.org/0000-0002-8798-2929 and Parker, Andrew ORCID logoORCID: https://orcid.org/0000-0001-6842-3067 (2015) Long-term engagement with a practice-based exercise referral scheme: Patients' perceptions of effectiveness. European Journal for Person Centered Healthcare, 3 (3). pp. 369-376.

Official URL: http://ubplj.org/index.php/ejpch/article/view/1006

EPrint URI: https://eprints.glos.ac.uk/id/eprint/2674

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Queen, Martyn and Crone, Diane and Parker, Andrew (2015). *Long-term engagement with a practice-based exercise referral scheme: Patients' perceptions of effectiveness.* European Journal for Person Centered Healthcare, 3 (3), 369-376. ISSN 2052-5656

Published in European Journal of Person Centered Healthcare, and available online at: http://ubplj.org/index.php/ejpch/article/view/1006

We recommend you cite the published (post-print) version.

The URL for the published version is http://ubplj.org/index.php/ejpch/article/view/1006

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ARTICLE

Long-term engagement with a practice-based exercise referral scheme: Patients' perceptions of effectiveness

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Abstract

Objectives: Limited and contradictory evidence exists on the long-term effectiveness of exercise referral schemes (ERS) for physical activity promotion and its impact on perceived health status. The intention of this study was to investigate patients' views of a physical activity intervention on their self-assessed health status, a key component of person-centered healthcare.
Methods: A longitudinal qualitative study design was employed with 12 patients aged 55-74 attending a primary care physical activity intervention. Semi-structured interviews took place on 3 occasions over a 12 month period in a Primary Care Health Centre. Transcripts of recorded interviews were coded and thematically analysed using grounded theory techniques.
Results: The majority of patients believed that their engagement with the Scheme and resultant long-term increase in physical activity behaviour, helped to improve their health status. This was evident through improved perceptions of medical conditions, through stabilisation or reductions in medication and visits to medical services.
Conclusion: The findings show the value of a long-term physical activity intervention in a Primary Care setting, through increases in physical activity levels and patients self-assessed health status. These findings can serve as a guide for future service commissioners of ERS.

Keywords

Grounded theory, health and wellbeing, interpretive methods, interviews, longitudinal study, person-centered healthcare, physical activity, primary care, qualitative analysis

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Accepted for publication: 25 March 2015

Introduction

The physical and mental health benefits of physical activity are well established [1-3]. These include improvements in cardiorespiratory and muscular fitness, bone health, cardiovascular and metabolic health biomarkers and reduced symptoms of anxiety and depression [2]. Furthermore, physically active people are less likely to suffer from vascular disease or premature mortality related to cardiovascular disease [4-6]. There are also benefits for those who already present with non-communicable lifestyle diseases. For example, reduced incidences of premature mortality have been found in type two diabetes patients who are physically active [7,8]. Non-communicable lifestyle diseases account for 60% of all deaths globally and include cardiovascular diseases, cancers and chronic respiratory diseases [9]. Global mortality rates from these types of disease are projected to increase by a further 17%, until 2018 [9].

Interventions to address physical inactivity first began to proliferate in the early 1990's with exercise referral schemes (ERS). The proliferation of these schemes have increased from around 200 in 1994 [10], to approximately 600 in 2011 [11]. In 2005 the National Institute for Health and Care Excellence (NICE) of the UK commissioned a study to assess the effectiveness of physical activity interventions [12]. ERS were assessed in relation to short-term, medium-term and long-term effectiveness. The NICE (2006) guidelines stated that ERS can have positive effects on physical activity in the short-term (6-12 weeks), but that they were ineffective at promoting physical activity in the long-term (over 12 weeks) or over a prolonged time period (i.e., over 1 year). One recommendation was that ERS should only be used within a Primary Care Trust if they form part of a randomised control study [12]. Consequently, research has since focused on randomized controlled trial (RCT) design. Evidence from these studies suggests that ERS may not be an effective means of promoting physical activity, due to high levels of dropout

[11]. A review of RCT studies found the numbers of patients achieving 150 minutes of moderate intensity physical activity per week from an ERS were no more than for usual care, no intervention or other exercise interventions [13]. Recent guidance from NICE [14] supports their previous recommendations [12] that ERS has only a marginal effect on increasing physical activity levels and that ERS are unlikely to be cost effective. This is in contrast to the evidence of the general benefits of physical activity *per se* on both physical and mental health [1,3,4]. Far fewer qualitative studies have been undertaken on the impact of ERS, particularly in the longer-term. However, those that have tend to represent schemes as having a more favourable impact on the promotion of physical activity than is generally represented with RCT evaluations [15-18]. We describe the impact that an ERS had on a group of patients with chronic lifestyle diseases, over a 12 month period of time.

Method

Design

We used a grounded theory approach to analyse the patients' experiences of their involvement with a primary care, practice-based, ERS [19]. The data were collected using audio-recorded semistructured interviews between February 2009 and January 2010 at a Primary Care Health Centre (PCHC) located in the South West of the United Kingdom. The study comprised 3 data collection and analysis phases over a 12 month time period. The study design contrasts with other studies on exercise referral in 3 specific ways. First, the majority of studies on exercise referral tend to be from a positivist theoretical perspective [20-24], rather than an interpretivist perspective [15,17,18,25]. Second, the deployment of 3 data collection and analysis phases differed to traditional schemes that have a 12 week intervention [15,26-30] and a 12 week follow up [31,32]. This Scheme was different to others and therefore other studies on exercise referral. Most schemes have a clear end point, usually 12 weeks, whereas this Scheme was on-going with no end point. Third, the semistructured interview schedules were initially developed from the extant literature in the area [15,27,33,34]. Both of the subsequent interview schedules in September 2009 and January 2010 were developed as a result of the themes that emerged from the initial interviews in February 2009.

Study Setting

The PCHC has 3 full time General Practitioners (GP), a practice nurse, a healthcare assistant and a phlebotomist, the centre also has a dental surgery on site. The PCHC is a GP training practice. The community gym located in the PCHC is the result of a partnership between the National Health Service and the YMCA. The gym is open 3 days of the week between 9.00am and 5.00pm. The gym runs an exercise on referral scheme and has won awards for fostering new community perceptions of health and fitness. The facility included a room for floor-based exercises and another room containing 4 items of resistance equipment with an additional 4 cardiovascular machines. In addition to attending the gym, patients are encouraged to develop habitual physical activity patterns in the form of walking. The reason for selecting a practice-based scheme is that PCHCs have been seen as appropriate venues for ERS, due the numbers of people who visit their GP on a yearly basis and that health professionals are considered to be reliable sources of advice [35]. The criteria used for the time periods between the interviews was based on the patients availability and the time frame needed to justify a longitudinal investigation.

Participants

The patients were recruited using convenience sampling techniques [36]. Informed consent letters were given by the exercise professional to the patients (n=17) enrolled in the Scheme. The majority of the patients (n=12) gave written consent to participate in the study. The patients had a number of diagnosed medical conditions and a range of comorbidities, as shown in Table 1. The patients were interviewed at the PCHC at 3 different time points during the 12 month data collection period, with all 12 patients attending all 3 interviews. The University of Plymouth, UK Research Ethics Committee approved the study. Two patients (negative cases) were waiting to join the Scheme during the 12 month data collection period but were unable to do so because of on-going health problems. However, they both agreed to participate in the 3 interviews (0, 8 and 12 months) and were included in the analysis to provide an alternative perspective [19]. All of the patients had the opportunity to attend the physical activity intervention at the PCHC 3 times per week.

Table 1 Patients' socio-demographic and morbidity characteristics

Characteristics	Patients Men [a] *n* (%)	Patients Women[b] *n* (%)
Gender	4 (33.3)	8 (66.6)
Age in years [mean (SD)]	68 (4)	59 (6)
Ethnicity/Race		
White	4 (100)	8 (100)
Life limiting diagnosis		
Angina	1 (25)	2 (25)
Chronic obstructive pulmonary disease	2 (50)	2 (25)
CHD	3 (75)	1 (12)
Morbid obesity	2 (50)	6 (75)
Chronic arthritis	3 (75)	1 (12)
Diabetes	0	3 (37)
Hypercholesterolemia	0	3 (37)
Hypertension	0	4 (50)

[a]n=4 [b]n=8

Data Collection Methods

All data were collected, coded and analysed by the first author. Semi-structured interviews were recorded on an Olympus Digital Voice Recorder WS-200S, transcribed *verbatim* and anonymised. Written field notes were also taken for corroborative purposes. The semi-structured interviews took place in a GP consulting room at the PCHC on all 3 occasions. To describe the study all patients were asked questions relating to their sociodemographic and morbidity characteristics at the end of the first interview, as shown in Table 1.

Data analysis

The memos that emerged from the coding processes were used as the method for generating grounded theory. We used the memos as a means of describing and explaining the impact that the ERS had on developing the patient's physical activity behaviour and examining the impact of their longitudinal engagement with the Scheme on their perceived health status [19]. We decided on manual data analysis in order to understand fully the richness of the data through human interpretation [37]. To ensure a robust approach to the application of grounded theory, we ensured that a number of critical characteristics were implemented throughout the data analysis. These included consecutive data collection and analysis (longitudinal data collection over 12 months). This enabled the analysis to cyclically inform the data collection process as is recommended in grounded theory studies [19,38]. Sequential analysis facilitated the development of concepts and categories from the data whilst at the same time allowing new possibilities to emerge from the data *via* subsequent data collection episodes. The data were analysed systematically by the first author to assure the continuation of theoretical development, the second author reviewed the concepts and categories from the data. Memos were used to formulate questions for the subsequent set of interviews. The first author advanced theoretical development through axial coding and the application of the axial coding paradigm, the second author assisted by reviewing this process [19]. Memos were used by the first author to explore the different dimensions of the emergent themes from the axial coded data, the second author reviewed this process. The final analytical characteristic used to ensure a robust approach to grounded theory analysis was the construction of the end product of the research [38]. This involved the first author selective coding the data [19,38] and developing a 'core story' from the axial coded memos, from which a core category developed. This, in turn, led to the development of a conceptual model, as shown in Figure 1. This was followed by a descriptive account of the findings, supported by evidence from the lived experiences of the participants in the study.

To further ensure interpretive credibility, the first author applied the following aspects of trustworthiness to the data collection process. *Credibility*, through prolonged engagement with the data, triangulation and peer debriefing. *Transferability*, through thick description and theoretical sampling. *Dependability* and *Confirmability*, through providing a clear audit trail. Reflection, through reflecting on the self and the method [39].

Results

Audio recordings of 12 patients were analysed on 3 occasions over a 12 month period of time producing 36 data sets. The majority of the patients who engaged with the Scheme over the 12 month data collection period were able to communicate the positive impact that the Scheme had on their perceived health status, as shown in Table 2. The 2 patients who were waiting to attend the Scheme, but were unable to due to continuing health problems, communicated deterioration in their perceived health status over the same period of time.

Table 2 Patients self-assessed health status at 3 time points

Combined men and women's self-evaluated health, adherers [mean (SD)][a]	
Baseline	7.1 (1)
Eight months	7.4 (1)
Twelve months	8 (1)
Combined men and women's self-evaluated health, non-adherers [mean (SD)][b]	
Baseline	3.7 (1)
Eight months	5.2 (1)
Twelve months	3.5 (1)

[a] *n*=10 [b] *n*=2

In Figure 1 we have presented a conceptual model which is configured around the core category of 'feeling better'. This core category was selected as it was central to all other categories, it emerged from the data and the concept was able to explain variation as well as the main point made by the data, which are requirements of a core category [19]. The core category, 'feeling better', represented how patients perceived their health status to have been affected over the 12 month period of engagement with the Scheme. Most of the patients were able to give tangible examples of how they believed that the exercise referral Scheme had helped them to manage their medical conditions, which resulted in them 'feeling better'. Below each aspect of the conceptual model is described.

Casual Condition

The causal condition 'perceived health status' is a characteristic of the core category 'feeling better'. It relates to sets of events or happenings that influence the phenomena. This characteristic had an influence on the effectiveness of the scheme, as perceived improvements in health status were a motivational factor for adherence. The properties of the 'perceived health status' causal condition considered the dimensions of feeling 'a lot healthier' for

those patients who engaged with the Scheme, to 'deterioration' in their medical conditions for those patients who were unable to participate in the Scheme.

Figure 1 Model of conceptual framework demonstrating how long-term involvement in the ERS impacted upon on the perceived health status of the patients

The property of 'a lot healthier' had both positive and negative associations with the extent to which patients adhered to the exercise referral scheme. Prior to take-up of the Scheme all patient's (*n*=12) perceived their health status as being relatively poor. For example, Patient 1 stated that she considered herself to be very 'poorly' with her medical conditions being life threatening:

> "The very first time I went and was sent for exercise I was poorly. I was overweight and had very bad angina at the time. I was told I would have a good twenty or so weeks to live if I didn't shift myself and do something different. So I went straight down and joined the gym and changed my diet."

Within a few months of taking up the Scheme the majority of patients reported that they were feeling better. Some patients (*n*= 6) used their own self-assessment scale to communicate how they were feeling. The scale ranged from 1 being unhealthy to 10 being healthy. Patient 2 used the scale to explain how he was feeling:

> "On a scale of 1-10, I would say about seven. That is how I feel inside anyway, I feel really good. I was first diagnosed with angina and everything about three and a half years ago."

The property of 'deterioration' was represented by 2 patients unable to join the Scheme due to on-going health problems. However, these patients were interviewed and included in the data analysis to provide an alternative perspective. Perhaps not surprisingly, these individuals reported low levels of health status. Patient 3 identified how his chronic obstructive pulmonary disorder made it difficult for him to perform basic tasks:

> "I get very frustrated. I can't do a lot of simple things that other people take for granted. Not being able to put a pair of socks on. I get out of breath."

Patient 4, who was also unable to participate stated that:

> "I have been having on-going blood tests and have been on antibiotics. I have also been under the doctor and hospital having different tests."

Actions

Action strategies related to purposeful acts undertaken to solve a problem in doing so shape the phenomena. The main theme that emerged as a means of facilitating the core category 'feeling better' was 'physical activity behaviour'. The property of the action strategy 'physical activity behaviour', related to the patients' understanding of the application of the exercise intensity necessary for health gains and the short-term 'physiological responses' experienced by the patients during exercise. During the group-based exercise classes, some of the patients were able to give examples relating to 'physiological responses' to exercise, which demonstrated they were exercising at an appropriate intensity. For example, Patient 5 who was an angina sufferer explained how she knew that she was exercising at the correct intensity, because her heart rate had increased, her breathing was under control and she was not in any pain:

> "I can feel my heart beating faster but I am not in any pain so I think that is fine and I can hold a conversation while I am walking and I'm fine."

Patient 3 knew if he had been working at the correct intensity because he would have a higher peak flow score on the days that he participated compared to those when he was unable to:

> "I can get a higher score if I used a little bit more effort, then my peak-flow will go up at the end of the day."

Several patients knew that to work at the correct level for health gains they had to maintain the intensity of exercise. Patient 5 knew when she was walking at the correct pace because she felt good at that point:

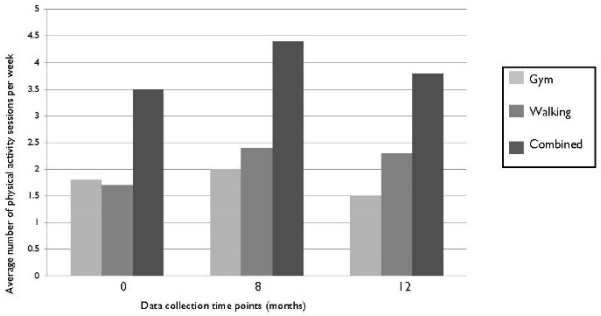
> "I try to keep a good pace up as I really do love walking. I can feel the energy when I'm walking briskly, it's a feeling of wellbeing."

In contrast, Patient 6 used hill walking as a means of keeping up the correct intensity:

> "I don't walk very fast but we live on a hill so I will walk up that."

The patient's physical activity patterns changed over the 12 month data collection period. At the first time-point, they participated in similar amounts of combined exercise classes and walking sessions per week, as shown in Figure 2. At the end time point this had changed, with patients participating in less organised exercise and more independent activity in the form of walking. The patients took part in 3.5 combined gym and walking sessions per week at the first time point, which increased to 3.8 sessions at the final time-point. This indicates that a practice-based ERS with small group of patients can not only help to sustain physical activity behaviour in the long-term, it can increase physical activity behaviour in the long-term.

Figure 2 Development of physical activity behaviour



Consequences

Consequences related to a range of outcomes that resulted from the actions and interactions identified above. Two consequence themes emerged from the data, these were 'health status' and 'medical implications'. At the second time-point (8 months) in the study all (*n* =10) of the patients who had taken up the referral, reported increases in perceived health status. Patient 5 explained how her perceived health status had improved:

> "I am definitely a lot healthier now. My blood pressure is perfect, when before it was quite high, my cholesterol is fine. Everything really, I just feel so much better in myself."

Similarities in improved health status were reported by Patient 7:

> "I am a lot healthier because I feel a lot fitter with the walking and the gym. I have been moved up to level two which is harder and I do it for longer periods of time."

At the final time-point (12 months), those patients (*n* =10) adhering to the Scheme continued to report feeling healthier. For example, Patient 8 who had used her own self-assessment scale, with one being unhealthy and ten being healthy, stated that:

> "I would say about seven to eight out of ten now. Twelve months ago I would say about four. I would say it's the exercise classes that have had the biggest impact. I have also been put on a new inhaler."

In contrast to those patients who had perceived improvements in self-assessed health status, perceptions of health status remained low for the 2 patients who had experienced on-going health problems over the 12 month data collection period. Patient 9 explained how he perceived deterioration in his health status:

> "Twelve months ago I would say about seven now I would say about five. My health has deteriorated. It's the disease I've got, it's never going to improve unless some new medicine comes along then it's just going to get worse year-by-year."

Similar declines in health status were reported by Patient 4 who stated that:

> "It's the arthritis and I get very short of breath. It's my body, there is so much going on with it."

There appeared to be a link between the self-reported health status of the patients and adherence to the Scheme. Those who attended, reported improvements in perceived health status, while those who did not reported a decline.

Medical Implications

The second consequences theme that emerged from the data was 'medical implications'. This theme had 3 properties, these being: (1) medical conditions; (2) medication and (3) access to medical services. The patients (*n* =10) who engaged with the Scheme over the 12 month period were able to give examples of how it had positively affected their diagnosed medical conditions. For example, Patient 2 identified improvements in her diabetes and cholesterol level:

> "My diabetes is a lot lower than it used to be and my cholesterol is low."

A further example was given by Patient 9 who explained that the exercise had prevented him from having to have a hip replacement:

> "I was diagnosed as having a hip problem which was thought might need a hip replacement. The exercise in general was to control that. I used to use a stick, so the exercise has had a big impact."

These affects appeared related to the patient's time on the Scheme and engagement with it over the 12 months.

Patients were able to identify improvements in their health status though either stabilisation or reductions in their medication. For example, Patient 10 explained how the medication that she had been taking, to help her to manage her COPD, had decreased over the 12 month data collection period:

> "I used to have a nebuliser but I don't use that at all now. I don't use the Ventolin inhaler as much now either. The dose has been reduced by about three quarters."

Reductions in medication were also reported by Patient 9 who had been diagnosed with CHD, arthritis and being morbidly obese. He described how his medication had been reduced:

> "I would say my medication has been reduced by about 80%. My medication has been reduced for the hip problem and one of the heart tablets has also been stopped."

While reductions in medication were not prominent for the entire sample, the majority reported how their medication had either reduced (n =3) or stabilised (n =6) over the 12 month time period. The important point here is that none of the patients who attended the Scheme, had to increase their medication. The 2 patients who were unable to engage with the Scheme reported increases in their medication. Patient 3 explained how he had increased his steroid medication:

> "In the past 12 months I have been taking more steroids because, if I have an infection I would take 30mgs a day for seven days to try and help my breathing but now I am taking 40mgs a day to try and increase my breathing."

A further way in which patient's identified that their health status had improved was because their visits to medical services had either stabilised or decreased. Five patients reported reduced appointments to medical services and 5 were accessing medical services at a similar rate as reported previously. Patient 8 who had been diagnosed with COPD, explained that as her chest infections had decreased she no longer needed to access medical services so often:

> "I don't really go to the surgery very much. I would say I go less than I used to as I don't get as many chest infections now."

However, due to a number of medical problems, Patient 9 who had a musculoskeletal diagnosis, was still accessing medical services the same as he had been over the year:

> "About the same, I don't think there's much difference. I saw the doctor over a month ago regarding the hernia and it has now flared up, but prior to that it was probably two months ago."

The 2 patients who were unable to attend the Scheme due to on-going health problems increased their visits to medical services over the 12 month period. Patient 3 who suffered from COPD explained that he thought this was due to an increase in chest infections:

> "I think it has gone up purely because I've had infections on my chest."

Patient 4 also explained that her chest infections had had increased her visits to her doctor:

> "I am seeing the doctor more because of my ear and I have had chest infections lately and been given antibiotics to clear them up."

Therefore, those patients who engaged with the Scheme were able to identify improvements in health status, evident through stabilisation or reduction of their medication and access to medical services.

Discussion

Increases in physical health, physical conditions, physical activity and fitness status have been reported elsewhere for physical activity interventions [15,41,42]. Reduced incidences of all-cause mortality have been shown to be associated with cardio-respiratory fitness in obese patients [41]. In our study most of the patients (n =9) had been inactive and obese for long periods of time prior to engaging with the Scheme.

Previous findings from both qualitative [15,18,20,25] and quantitative [23,27,28,32] research in exercise referral has shown that ERS can promote physical activity in the short to medium-term (12-26 weeks). In our analysis of 12 seriously ill patients participating in an ERS, we found that long-term engagement with a practice-based scheme aided physical activity adherence and increased combined (walking and exercise classes) physical activity levels, in the long-term. These findings are in contrast to recent reviews that found limited evidence to support the use of ERS in primary care [11,14]. The patients in this study were able to give examples of how the physical activity that they had undertaken had positively affected their diagnosed medical conditions over the 12 month period.

In our study we found that, through a long-term physical activity intervention in a primary care setting, the resultant physical activity improved patients self-assessed health status. This was evident through patients reporting tangible but self-reported improvements in perceptions of their medical conditions, stabilisation or reduction in medication and less reliance on health professionals evidenced by a self-reported reduction in visits to medical services. Our study provides contrasting perspectives from the patients who were unable to attend the Scheme due to on-going health problems. These patients showed decreases in perceived health status throughout the 12 month data collection period and a continued reliance on medication at the same or a higher rate. Our findings are in contrast to other views that suggest ERS are no better than standard care [11], were ineffective at promoting physical activity in the long-term (over 12 weeks) [12] or only have a marginal effect on increasing physical activity levels [14].

While this research has produced qualitative evidence with regard to the long-term impact of a practice-based ERS, several limitations have been identified and the results should be viewed in light of these strengths and weaknesses. Strengths include the transferability of the findings to similar settings and the robust approach to data analysis that is commensurate with grounded theory methodology. Limitations include that the patients being selected for the study were based on a convenience sample, drawn by the exercise professional that ran the Scheme.

This may have resulted in those patients being more likely to adhere to the Scheme and attend the interviews being selected for the study. The small sample size in this study prevents the findings from being generalizable to larger populations. However, the vigorous approach to data analysis and the steps taken to ensure a robust approach to data collection, means that these findings are transferable to similar schemes, situations and patients.

This study has shown the value of a long-term physical activity intervention in a primary care setting. We have shown that long-term engagement with a primary care practice-based ERS can help to develop long-term physical activity behaviour in a group of seriously ill patients. We have also shown that the resultant physical activity can positively affect patients self-assessed health status and help to stabilise or reduce patients' medication and use of health services thereby actively contributing to an increase in the person-centeredness of healthcare. We therefore recommend that the value of ERS should be considered from a longitudinal perspective rather than as a short-term fix to a complex behaviour adoption of becoming more active.

Acknowledgements and Conflicts of Interest

We thank the patients, primary care staff involved in referrals and the exercise professionals who ran the Scheme. We would also like to thank the Primary Health Care Centre for their help and commitment to this project, without which it would not have been possible. These findings derive from a part time PhD study funded by the University of St Mark and St John in Plymouth, UK. We declare no conflicts of interest with respect to the authorship and/or publication of this article.

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