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Editorial

Beyond "#endpjparalysis", tackling sedentary behaviour in health care

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Abstract: Reducing Sedentary Behaviour after hospitalization starts with reducing sedentary behaviour whilst in hospital. Although we have eradicated immobilisation as a therapeutic tool due to its potent detrimental effects, it is still in systemic use within health care systems and hospitals. Evidence shows that when in hospital, patients spend most of their time sedentary. In this editorial, we explore the determinants of, and a system-based approach to, reducing sedentary behaviour in health care.

Keywords: sitting; physical activity; ageing; inactivity

1. Introduction

Whilst in hospital, a person will spend the vast majority of their day sitting or lying and mostly alone [1]. Sedentary behaviour is defined as spending time sitting, reclining or lying, without expending much energy (<1.5 METs) [2,3]. In hospital, patients can spend 12 hours per day sedentary, often in a long uninterrupted bout of sedentary behaviour sitting near their bed or lying in bed [4]. Prolonged sedentary behaviour has been observed in orthopaedic, geriatric, neurology, rehabilitation and medical wards in hospitals around the world, using a wide variety of physical activity measurement techniques [4–9]. For example, patients with stroke spend only 8% of their day in an upright position in a rehabilitation ward [8] and on a geriatric rehabilitation ward patients were in an upright position for only 70 (± 50) minutes per day, with 70% of this time spent

in standing or walking bouts of less than 5 minutes [4]. Sedentary behaviour has profound detrimental effects on physiological processes in a matter of hours [10] and these effects seem to accumulate over time [11]. Spending too much time sedentary is associated with increased risk of chronic disease, hospitalisation and premature death [12].

There is mounting evidence that people who spend time in hospital, because of musculoskeletal injury or other acute or chronic conditions, tend to adopt a much more sedentary lifestyle while in hospital and that this perseveres after discharge [7,13–15]. Upon discharge, people engage in less physical activity and tend to spend more time in sedentary behaviours; this appears to be true even if they have recovered to full functional capacity and are medically stable [15]. Indeed, discharge physical function (assessed using tests such as Timed up and go or gait speed) and fear of falling are better in those who spend more time upright and mobilising whilst in hospital [16].

Too much sedentary time in hospital is likely to contribute to 'Post-hospital syndrome', an acquired condition of vulnerability [17]. This syndrome shows itself in the critical 30-day period after discharge, where up to a fifth of older people have a further hospital admission, often with no link to the previous admission cause. This vulnerability might derive as much from the hospital stay as it does from the lingering effects of the acute illness that precipitated the first admission.

It is not acceptable that people are exposed to further health risks if they have to go into hospital. We have long known that bed rest has poor clinical outcomes and we have gradually successfully eradicated it as a treatment modality. We have also long known that movement is essential to recovery and health, even in intensive care units [18]. Despite this, it is undeniable that traditional care in hospital tends to limit movement and enforce sedentary behaviour, perhaps as a result of concerns about falls on the ward, and that this impacts on behaviour and health after discharge. We need to identify and change the practices, processes and systems that condition sedentary behaviour during hospitalization [19–21].

A profound transformation of health care systems and hospitals occurred because of the rise in hospital acquired infection. Today it is time that we also address the iatrogenic (defined as any effect on a person resulting from any activity of one or more healthcare professionals that does not support a goal of the person affected) effect of our health systems on health behaviours.

2. A wicked problem

In 2016, Brian Dolan launched a social media campaign called #endpjparalysis (http://www.endpjparalysis.com). This was the first really sizeable attempt at addressing systemic issues of immobility in hospital and health care. The campaign aims to encourage patients to remove their hospital uniform (pyjamas or 'pj') and wear their day clothes. The idea behind the campaign is that if people get up and get dressed they will get moving and this in turn will prevent complications of being immobile, including chest infections, muscle degeneration and blood clots. In addition, the idea is to enhance dignity, autonomy and shift a person's perception from 'I'm sick' to 'I'm getting better', possibly also fostering more active behaviour post discharge. This has been a very successful social media campaign (judging by the volume of social media activity), as it has caught the imagination of nurses, allied health professionals and medical staff worldwide. It has raised awareness amongst health care staff and encouraged them to consider how they could encourage people to be more active in hospital. But will this have a real impact on immobility in hospital settings?

There is no doubt that the campaign will change the hospital stay of many individuals, but will #endpjparalysis on its own result in large scale and sustainable systemic change benefiting all patients? Current thinking about the determinants of sedentary behaviour suggests that #endpjparalysis will not be enough. The campaign is built on the premise that the only actors in changing movement behaviour are the patients themselves and the staff, without consideration of other barriers inherent to the health care system and hospitals. For example, patients may need support in mobilisation, but there may not be enough staff available to get patients up regularly due to low staffing levels, or there may be interruptions from staff rounds and shift patterns. Staff may be concerned about falls risk and feel it is safer, or quicker, to move the patient by wheelchair or to bring a commode over, rather than mobilise the patient to the toilet. Organisational risk aversion often takes precedence over function focussed rehabilitation, mobility and promoting physical activity [22,23]. These more upstream determinants are ultimately more powerful at shaping behaviour than the determination of individuals [24]. The idea that health behaviour rests solely on the individual is highly prevalent in a medical model of health care, but evidence clearly points to system-based interventions as being more effective. Perhaps #endpjparalysis is too simplistic. Sedentary behaviour is a "wicked" problem [25,26], simple on the surface but extremely complex in reality, and resistant to resolution. Wicked problems are characterised by the influence of multiple factors all interacting and deeply entangled. How can a patient move more in an environment that people normally sit or lie down in? How can that environment be changed if there are not enough staff or the right insurance policy to do so safely or at least subjectively safely? Another example of a "wicked" problem is obesity. Seemingly simple, all we have to do is eat less and move more, but all our attempts to solve it have failed as it is a complex interplay of issues [27]. One of the main characteristics of such wicked problems is that individuals often feel rapidly powerless to act against them which then leads to inaction. Acting at the system level through the development of localised solutions, co-created with all the stakeholders involved in the running of the system, is often more effective in this situation [28].

In 2015, a consensus of experts produced a map of the determinants of sedentary behaviour called the SOS (System Of Sedentary behaviour) framework to help researchers, practitioners and policy makers come to terms with the complexity of the problem and plan system-based interventions [25].

This evidence based framework (Figure 1), shows that sedentary behaviour is conditioned by six clusters of factors: (1) the physical health and wellbeing of a person; (2) the social and cultural context a person is immersed in; (3) the natural and built environment a person lives in; (4) their psychology and behavioural attributes; (5) political and economic factors, and; (6) the institutional and home setting a person is in.

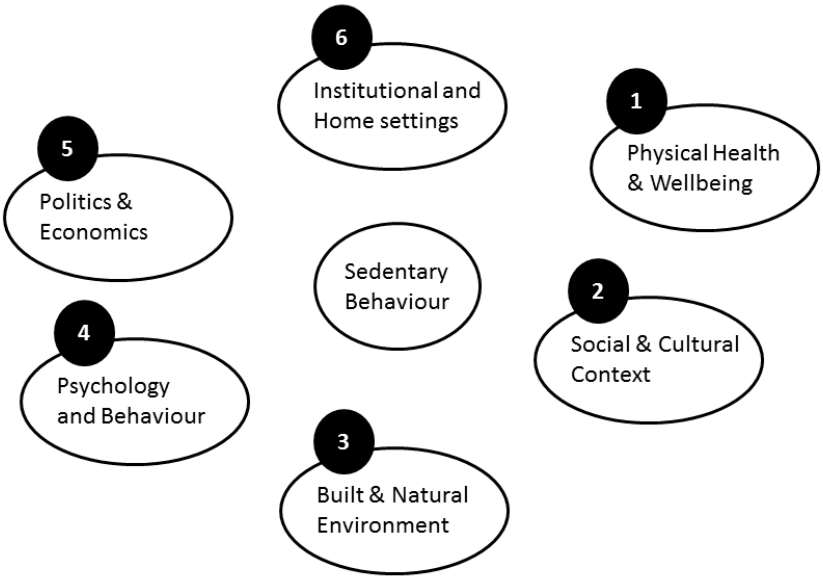

Figure 1. The system of sedentary behaviour framework reproduced from [25].

3. Beyond #endpjparalysis

Recently there has been a drive to decrease sedentary behaviour and increase physical activity in the in-patient setting outside of classic "therapy time". Any change to healthcare delivery must take into consideration local needs and drivers. A "one size fits all" approach is not appropriate. Sites need time to work as a team to review service provision and to identify how appropriate improvement can be made involving all stakeholders on an ongoing basis. Function focussed care is one such example [29]. The Model for Improvement is a recognized model for making this type of improvement in the healthcare setting [30]. Sedentary behaviour in the clinical setting is a complex issue. It is affected by culture, environment, people and operational processes, as can be seen in the fishbone diagram in which the SOS framework is contextualised to hospital settings (Figure 2).

Notwithstanding the importance of site specific planning, some common solutions will be appropriate in many circumstances. Starting with the patient being central to care provision, the patients, families/carers and the multi-disciplinary team (in both acute and community settings) can work in partnership, to ensure the patient's transition through the health and social care system is a continuum. Patient and family/carer education that is accessible and brief should be provided with a consistent message provided from all professionals covering the importance and benefits of minimising prolonged periods of sedentary behaviour, along with very specific advice for the individual as how to mobilise, how often, and how a family member/carer can assist with this.

Pivotal to this is having prompt access to mobility assessment and any appropriate aids, in line with any step change in function. Indeed, one recent study showed that length of stay was reduced in patients who had a physiotherapy assessment within 24 hours of admission compared to those who waited longer, and were less likely to be discharged to formal care [31]. Complex cases require timely in-depth assessment, such as that provided by Frailty Teams (https://ihub.scot/frailty-at-the-front-door/).

High quality assessment should lead to care that supports self-management, therefore empowering the individual to have ownership of their own well-being, with patient centred goal setting and action

planning that is reinforced by staff on the ward. To support this, patients should have access to well established techniques for management of energy, mood, pain and sleep. Person held care plans, such as My Active Care Plan (https://sedentaryblethering.wordpress.com/2018/05/25/my-active-care-plan/), allow recording, communication, and motivation to support self-management and partnership working.

Rehabilitation should be central to the waking day, not just during specific therapy sessions, thus movement should be encouraged during the daily routine, and as much as possible, keeping to what is normal or would be expected in the home environment. The culture, staffing levels and physical environment of the hospital should be conducive to movement and appropriate to varying levels of patient's ability and confidence and be supported by management. The final facet is to ensure we have a resilient workforce that learn from each other by sharing good practice, in an inter- and cross–professional manner, for the best outcome for our patients.

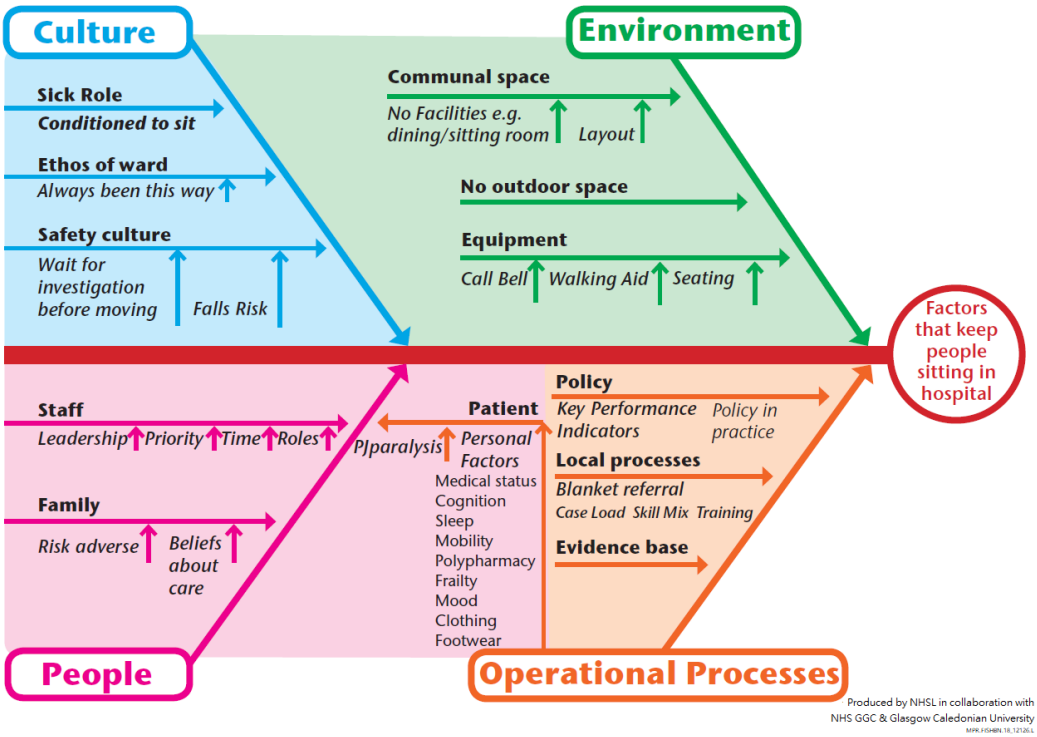

Figure 2. Operationalisation of the SOS framework applied to the problem of sedentary behaviour in hospital. Four clusters of factors; Culture, Environment, People, Operational Process determine sedentary behaviour in hospital. Example of factors for each of the clusters and their relationship are presented.

4. Evaluating the effect of changing practice and getting help from technology

One of the key things in this whole debate, is that there is only limited evidence of the effectiveness of campaigns such as #endpjparalysis on sedentary behaviour, the specific behaviour it is looking to change. Generating this evidence requires effective measurement of sedentary behaviour, but unfortunately it can be tricky to measure in a hospital ward environment.

Direct observation (independent observers watching the participant and recording when they are

lying in bed, sitting, standing and walking) is cited as the gold standard measurement of sedentary behaviour in validation studies [32]. However, in the ward, direct observation it is not practical, as it is time-consuming and has ethical issues regarding privacy. Although it may seem a simple solution, getting ward staff to observe participants behaviour might be very difficult to implement. Asking patients to record sedentary time may suffer from underestimation, as self-report of sedentary behaviour in the general population can underestimate sedentary time by up to 4 hours per day [33]. In a ward context, the likelihood of the presence of co-morbidities (e.g. poor memory and cognition) that detrimentally affect known sources of bias in self-report (e.g. recall and perception of time) would exacerbate such errors. Therefore, objective measures of sedentary behaviour are preferable, as they are able to measure continually, in an unobtrusive manner, and provide an un-biased measurement of behaviour.

Body-worn sensors, usually accelerometers, are used to measure physical activity and sedentary behaviour objectively, and wear location (hip, wrist, or thigh) is one of the key characteristics that differentiate between different types of monitor for sedentary behaviour measurement. Accelerometers worn at the hip and wrist actually measure low movement, rather than the posture of sitting. This means that some quiet standing can be misclassified as sedentary behaviour, limiting applicability in the ward [34]. In contrast, monitors worn on the thigh, use thigh inclination to accurately distinguish between the postures of sitting and standing [35]. However, it should be noted that these monitors do not usually distinguish between sleep, lying awake and sitting, and it might be useful to keep a diary of time awake and time in bed. Although it may be tempting to use pedometers, accelerometers or commercially available activity trackers, to count steps taken, without specialised modification [36,37], most of these tools are not effective for very slow walking or shuffling gait, which means step count is not a good outcome measure to use in the ward [38].

Although currently not widely used in hospital settings, recording time spent in a location might serve as a suitable proxy measure to indicate mobility and social interaction. GPS systems do not generally work indoors, but there is potential to use systems such as RFID tags, bluetooth sensors or LED-lights, to log time-stamped location within a building [39]. This does require initial investment to set-up sensors throughout the building, but is easy to run thereafter, so may be suitable for long-term projects in a single hospital.

5. Conclusion

Sedentary behaviour is a systemic and complex problem in the health care system. Interventions targeted solely at changing patient's behaviour are unlikely to work. Instead, a system-based solution approach would be advantageous with local health care teams and other stakeholders co-creating sustainable solutions that synergistically target changes in the environment, policy, institutional settings and culture. Recording progress, specifically in terms of measuring sedentary behaviour, is fundamental to achieving effective solutions.

Conflict of interest

The authors declare no conflict of interest.

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