

Rehabilitation technology and the reproduction of bodily normality: a critical analysis of robotic gait training in Turkey

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ABSTRACT

This paper focuses on rehabilitation technology, more specifically robotic gait training conducted with a device called 'Lokomat' and its impact on the reproduction of bodily normality within the Turkish context. It draws upon an ethnographic study carried out in a major Turkish rehabilitation hospital and the analysis of the Lokomat's media representation in a health-related television programme. Interviews were conducted with 42 persons (11 medical staff, 2 non-medical staff, and 20 current and 9 former patients). The paper argues that the use of technology is shaped by the relevant sociocultural background. This background comprises both the specificities of the Turkish context more generally – such as its especially unwelcoming environment to the disabled body – and the discourses on the Lokomat more specifically, which create a miracle image of this device as facilitating walking. Thus, the Lokomat's presence deepens the normal/abnormal divide and reproduces it as walking/non-walking.

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Introduction

Following the 1970s and concomitant with developments in information technology, many post-industrial theorists (eg Bell 1973) enthusiastically embraced a kind of technological determinism and highlighted the potential of technological advancement to unfold its own logic upon socio-economic structures (Gleeson 1998, 102; Roulstone [1998] 2005, 113). The reflection of this scenario onto the medical field has included major developments in medical technology – for instance, in reproductive or assistive technology and genetic research – and the belief that medical knowledge would progressively understand the human body and compensate for its 'flaws'. In relation to disability, the argument has been that technology would 'cure' or 'undo disability' (discussed in Roulstone [1998] 2005; Seymour 2005; Moser 2006, 374; Harris 2010). Scholars writing from a Disability Studies perspective have criticized such technological determinism and emphasized the social context within which technological advancement takes place. In this regard, Moser (2006) has highlighted the dominance of 'an order of the normal' (373) and argued that, without the transformation of this order, technology could even exacerbate the normal/abnormal division.

This paper focuses on rehabilitation technology, more specifically robotic gait training¹ and its impact on the reproduction of bodily normality in Turkey. It is based on fieldwork conducted in a major Turkish rehabilitation hospital and argues that the role of technology in rehabilitation is strongly shaped by the sociocultural context. The research questions include the following: What is the role of rehabilitation technology in shaping conceptions of disability/walking/non-walking in Turkey? What

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are the main factors influencing this role? We try to answer these questions through a critical reading of how a newly installed gait training device (Lokomat) worked as part of the rehabilitation process in the above-mentioned hospital, including how it is perceived and used by doctors and received by patients and their families. The Turkish context is of particular importance, because of its environment, marked by inaccessibility and stigmatization, being especially unwelcoming the disabled body. This strengthens disabled people's attachment to the idea of walking and thus increases their expectations from technology. There are two additional determinants reinforcing this perception: First, at the time when the Lokomat became part of rehabilitation practices in this hospital, the device was introduced to the Turkish public through a popular television programme on health, called *My Doctor (Doktorum)*. We argue that the Lokomat's media representation was structured such that – sometimes overtly, other times covertly – it promoted the device as extraordinary technology that would 'cure' disability. Second, within the hospital, discourses on the Lokomat by medical staff in their interaction with patients demonstrate great vagueness in terms of its benefits for walking. Thus, for the patients, the Lokomat's purpose remains highly elusive and open to interpretation. This openness often serves to reinforce the belief that it indeed facilitates walking. These two factors – media representations and in-hospital discourses – together with the contextual background, as well as the general trust in technology to 'undo disability' (Moser 2006, 374) reinforce the Lokomat's image as a miracle-worker and reproduce the idea of the 'normal body' as the walking body.²

The paper begins with a section on methodology, followed by a literature review on medical technology, disability and robotic gait training. The subsequent part focuses on physical rehabilitation in Turkey, followed by our analysis of the case study. This analysis starts with a description of the way in which the researchers were introduced to the Lokomat and continues with an examination of the device's representation in the media and in-hospital discourses. Next we discuss five features of the Turkish context, which work to strengthen disabled people's trust in the 'curing' effect of technology.

Methodology

This paper draws upon a larger ethnographic study conducted in a major rehabilitation hospital in Turkey, in the summer and fall of 2013. Ethical consent for this study was granted by both Koç University's Ethics Committee and the Secretary General for the Turkish Association of Public Hospitals. The hospital was visited approximately 3–4 times per week during summer, and twice a week during fall. Semi-structured interviews were conducted with 42 persons, including 7 doctors, 2 nurses, 2 physiotherapists, 2 non-medical personnel, 20 in-patients, and 9 former patients who now live at home. For the sake of anonymity numbers were used to denote interviewees, together with the letters D for doctors, PT for physiotherapists, NMS for non-medical staff, and P for current/former patients. The interviewees were more than 20 years of age and had acquired physical disabilities through traumatic injury or illnesses. Every hospital visit lasted at least half a day; researchers conducted several hours of observations, participating in the patients' everyday lives, taking part in their conversations, and sometimes accompanying them in their physical exercises.

The purpose of the initial study was to analyse social constructions of disability in rehabilitation and disabled people's experiences thereof. The ethnographic method was chosen, because it provided a powerful tool for exploring such a complex phenomenon and allowed the researchers to become a part of daily life within the hospital, so that they could observe in detail the process of rehabilitation (practices, examples, emotions, negotiations), while maintaining their outsider perspective. This opportunity for detailed and close observation also allowed for the discovery and further exploration of variables and factors left hitherto unconsidered. Unexpectedly, the fieldwork pointed to the fact that, for both medical staff and patients, the recent installation of the Lokomat at the hospital was immensely important, since it had a major impact on patients' expectations concerning the recovery of their ability to walk.

Thus, for this paper, we re-examined our field notes and interview transcripts with a special focus on the Lokomat and its role in rehabilitation. This re-examination clarified three points: (1) the role of

the television programme *My Doctor*, which in a well-known episode announced the arrival and covered the benefits of the Lokomat; (2) patients and their families' belief that regular use of the Lokomat would recover their capacity to walk, even in case of spinal injuries; and (3) doctors and medical staff's admission that there was no medical/statistical proof of such benefit, coupled with a reluctance to discuss this openly with patients, due to motivational reasons. It is around these three points that we formulated the analysis of our data.

Medical technology, disability, and robotic gait training

Medical technology and disability

Questioning the neutrality of technology, disability scholars have developed a critical approach to the relation between medical technology and disability and concentrated on three types of technological advancements, not necessarily mutually exclusive: (1) information and communications technology (ICT), with a special focus on the Internet; (2) assistive technology, such as refreshable Braille keyboards, screen magnifiers, and the like; and (3) special technology in its urbanized form, such as tactual or interactive maps to facilitate urban accessibility (Gleeson 1998). Scholars focusing on Internet use have analysed a range of issues, such as Internet accessibility for disabled people (Sheldon 2004), and its potential for integration or risks of isolation (Seymour and Lupton 2004; Sheldon 2004; Seymour 2005). Research on assistive technology has often focused on its relationship to the disabled body (Moser and Law 2003), with special focus on the normalizing effect of technology (Moser 2006; Söderström and Ytterhus 2010). Thus, questions about the extent to which assistive technology enables or disables people (Moser 2006), the subjectivities it constructs (Moser and Law 2003), and its symbolic value for disabled people have been raised (Söderström and Ytterhus 2010). Finally, work on technology and the urban space has questioned the extent to which accessibility problems can be solved through technological advancement (Gleeson 1998). In all of these discussions, one can discern a critique of technological determinism as well as an emphasis on the social context within which such technological advancement occurs. While Gleeson has highlighted the importance of the socio-political background, Moser has referred to the dominance of 'an order of the normal' (373). Without the transformation of this order, the Internet might lead to growing isolation, assistive technologies might reproduce normal/abnormal divisions, and urban accessibility might be achieved only parochially through *ad hoc* measures. In the light of this critical approach to technology, the section below will focus on robotic gait training in rehabilitation.

Robotic gait training in rehabilitation

There exists some work on rehabilitation robotics more generally and robotic gait training more specifically, almost all of it produced either by biomedical engineers or rehabilitation medicine professionals. It elaborates on the benefits of robotic gait training for improving the patient's overall health (Hidler et al. 2008), rehabilitation robotics from a historical perspective (Hilman 2003), and the future of robotics with an emphasis on 'break[ing] down the barriers between engineers and therapists' (Hidler and Lum 2011). It also talks about a 'paradigm shift for rehabilitation robotics', which highlights robotics as moving beyond assistive technology 'to a new class of physically interactive, user-friendly robots that facilitate recovery' (Krebs et al. 2008). In summary, the medical perspective dominates the literature on the use of robotics in rehabilitation.

In terms of its virtual reality dimension, Lewis and Rosie (2012) have criticized the existing literature for not accentuating user opinion and perspectives about virtual reality game-based interventions (1881). Their work is important for its effort to shift the focus from technicalities to user experience; yet, it remains within a medical perspective, since its interest in user feedback seems to lie in stimulating patient compliance with treatment (1880) and engagement in rehabilitation (1884).

Phelan, Wright, and Gibson (2014) stand out here, since they have developed an approach critical to rehabilitation and questioned the reproduction of normalization via technology, more specifically hearing aid and robotic gait training technologies. For this purpose, they question promotional materials prepared for these devices and argue that these create particular impressions of 'disability as constraining and of disabled identities as negative or damaged' (2075). Rehabilitation technology is then introduced to alleviate disability, promising efficiency, effectiveness, improvement, success, and opportunities for a 'normal' life (2075–2076) and as such prioritizing normality (2077).

Rehabilitation in Turkey

Almost concomitant with developments in the Western medical world, the coupling of physiotherapy and rehabilitation emerged as a medical issue in Turkey's predecessor state, the Ottoman Empire, at the end of the nineteenth century. The field has gradually developed throughout the twentieth century in contemporary Turkey, and gained special importance in the 1990s due to the war in Bosnia, the armed conflict between Kurdish insurgents and Turkish forces, work and traffic accidents, and an aging population. On 1 April 2013, a news portal in Turkey (Haber7) announced that the Ministry of Health would construct 26 new rehabilitation hospitals in 21 cities, in addition to the already existing 12 hospitals in 11 cities (2 of them in Istanbul). Parallel to a more general commercialization of medicine, the number of private rehabilitation centres has increased as well.

In this context of growing interest in physiotherapy and rehabilitation, the hospital where we conducted our research was highlighted as one of the most qualified and demanded in the entire country. One may thus assume that the way in which rehabilitation was defined and conceived there provides clues about conceptions of rehabilitation in Turkey more generally. Our interviews revealed three major points concerning this definition and conception: (1) although most senior doctors define and approach rehabilitation beyond medical terms (D1, D2, D3, D4), almost all agree that this definition is weakly communicated to patients, either due to the field's commercialization (D2) or the lack of technical capacities and staff (D1). (2) There is great deal of confusion around the definition of rehabilitation among junior doctors, nurses, and physiotherapists, blurring the boundaries between rehabilitation and physiotherapy (N1, D5), and the social aspect of rehabilitation appears to be neglected (for example, D5). (3) This situation is mirrored in the patients' view of rehabilitation, with some defining it as purely physical and equivalent to sports (P8, P9), and others as friendship, dialogue, and sharing of emotions and information among patients (P1, P10). Interestingly, although these approaches were widespread among current patients, more experienced ex-patients stated that they eventually realized that what they had learned in the hospital concerning rehabilitation was completely misleading. The hospital had failed to teach them what they could do in the world outside, and how they could live in a wheelchair (P4, P11, P12). The Lokomat's use was also informed by this context where it is employed to constitute another part of rehabilitation.

Exploring the discourses on and uses of the Lokomat in the Turkish context

The 'Robot' enters the scene: 'I will be leaving the hospital jumping'

That the Lokomat was mentioned at the beginning of our first interview in the hospital is very telling. P1, with a severe spinal injury, was lying in his bed, after three years of hospitalization and numerous operations. When asked how he had decided to come to this hospital, he told us the following:

My family, people around me insisted a lot. They said I should apply to the television program *My Doctor*, that people who participate in the program start to walk [again ...]. They insisted so much that I said, 'Ok, I'll do it'. I was probably lucky, they [people in charge at the programme] immediately asked for my medical reports and called me straight away to shoot footage of me at home. I told them what I went through, and I said that I had never lost hope, that I would walk again. The next day, I was brought to the hospital. All the doctors, and many people from the hospital, were welcoming and greeting me. I said to myself, better days are coming; I will be leaving the hospital jumping.

Despite the severity of his case and even though he had been told he would not be able to walk again, P1 accepted to participate in *My Doctor* in the hope that this hospital, famous for its success, and its miraculous 'robot' (as most patients referred to the Lokomat) would help him walk again. The 'robot' entered P1's discourse and imagination not as an assistive device for non-walkers, but as a step towards walking.

This belief continued to be sustained by two mutually reinforcing processes. On the one hand, the media coverage of P1's story in *My Doctor* was heavily misleading in this respect and well known by patients and their families, who continued to refer to it as a factor motivating them to walk. On the other hand, communication between patients and medical staff in the hospital was structured such that vague messages about walking as well as the Lokomat's role were circulating. This vagueness left room for the patients' imagination and their hope to walk again, equating rehabilitation with regaining the ability to walk.

P1's story in my doctor: 'I lost my voice, but neither my feet, nor my hope'

My Doctor was a popular television programme covering a wide range of issues loosely classifiable under the rubric of 'health', from dietetic advice and skin problems over sexual counselling to discussions of the risk factors, symptoms, diagnoses, and treatments of different illnesses. The programme aired from 2009 to 2013 on a major national channel (Kanal D) and hosted more than 1000 doctors and specialists to speak on specific issues. It received thousands of e-mails and letters from viewers, helped more than 5000 people receive treatment and another 200 be operated free of charge. It quickly turned into a media phenomenon, showing on live television an open heart surgery and a kidney transplant procedure, hosting major figures (from famous comedians to the incumbent Minister of Health), and inspiring similar programmes on other major national channels.³ At the beginning of 2014, the programme moved to another channel with a different cast, but soon went off air after ratings plummeted. Many viewers complained about the loss of this source of information on issues they could not share with doctors, friends, or relatives.

During the first four seasons (which included P1's story), the programme was hosted by a male doctor and a female host who, although not a doctor, wore a white coat to emphasize the show's medicalized approach. Each episode aired live, starting in the studio, with the two hosts and their guests introducing the issues to be tackled. The programme continued then inside and outside the studio, as hospitals were visited as part of the programme and specific treatments brought to the viewers' attention. Moreover, follow-up visits to and interviews with previously treated/operated patients were carried out.

P1's injury due to a motorcycle accident was one of the cases with which *My Doctor* decided to assist. As explained by P1, he was immediately contacted and very soon hosted on the show, where he told his story and met the chief physician of the above-mentioned rehabilitation hospital, to be taken shortly thereafter by ambulance to the hospital to start treatment. His arrival there was also televised: a crowd, including doctors, physiotherapists and nurses, greeted him at the entrance. The entire programme was based on the promise of a miraculous recovery and P1's never-ending dedication to walk again. A closer reading clearly reveals how the entire encounter between P1 and the others was organized so as to repeat the common message of the normality of walking, the disaster associated with non-walking, and patients' duty to keep themselves dedicated to overcoming this disaster. The hosts kept coming back to this discourse structured around an expected 'miracle', despite the chief physician's cautious attempts to explain that a spinal injury almost always means a new body and a new life, even if patients are inclined to concentrate on walking.

Below are two extracts from the dialogue between the doctor-host and P1:

Doctor-host: It is very hard for us to understand this because we can stand up. [What about] you, who cannot stand up – is it awesome to be standing?

- P1: It is so indeed. I keep dreaming about myself walking. Even last night – I saw myself walking again in my dream.
- Doctor-host: I saw how you were happy standing up with the help of this device [a sort of exoskeleton he sees on P1's past photos]. In order for you to walk without it, let's start this treatment now! Shall we? [audience cheering]
- P1: Let's start it now.

This dialogue in the studio, complemented by the non-doctor-host's comments on P1's strength, courage, and determination, was followed by and juxtaposed to another episode in the rehabilitation hospital. The camera was now in the physiotherapy room where both P1 and the audience encountered the Lokomat, explained and advertised at length by a third (non-doctor) host and another doctor working at the hospital. The host talked of 'a development that breeds hope' (certainly of walking again), which D1 presented as a computerized device that 'enables a patient, who lost walking, who cannot walk by herself, to walk as she did before the injury', through modules placed on both sides of the legs.

At the other end of the line, the doctor-host at the studio added that this was a 'mechanism that would make one feel as if walking, even someone who cannot walk at all'. The discussion about the Lokomat continued around the issue of walking, without any mention of its other benefits, while a person using the Lokomat was presented as 'learning to walk' and spectators were invited to witness 'the changes that the Lokomat would bring to the patient's life'.

This entire episode presented the Lokomat as a device that can teach walking to a person who has lost the ability to do so and therefore completely misled an audience unfamiliar with how the device works. When combined with the overwhelming expectation to walk again on the part of the patients, their entourage and society in general, the juxtaposition explained above left no room for alternative interpretations: P1 – greatly determined to walk again, helped by the professionals of *My Doctor*, and supported by the rehabilitation hospital – seemed to be destined to walk again by means of such miraculous technology.

Back in the studio, the doctor-host talked of the way 'a normal person walks', and P1 repeated his hope and dedication, emphasizing that he had lost his voice, but neither his feet nor his hope. 'And it is my advice,' he said, 'to anyone who is like me: Do not lose hope!'

Then they altogether moved to the ambulance, which took P1 to the hospital. Among a crowd of patients and staff, the third host welcomed P1 at the hospital: 'Your greatest hope, your greatest dream is about to come true,' she said, adding: 'Soon you will take firm steps.' The programme closed with P1's words: 'I promise before millions: I will leave the hospital on foot.'

My Doctor certainly was very popular and successful in terms of ratings; however, in a way this popularity was very dangerous. Despite (or maybe because of) its emphasis on a medical approach, it failed to escape the stereotypes associated with walking and disability within society in general. The way in which it articulated and presented disability remained within the scope of a medical model, as a tragedy that needs to be overcome, an anomaly to be cured, where the role of professionals and technology is paramount. The person with disability, in turn, is expected to try hard and make herself as normal as possible. In the case at hand, normality was associated with walking, turning the motivation for and scope of rehabilitation into training for walking again, the Lokomat being a miraculous technological advancement to this end.

Inside the hospital: 'it is a carrot-and-stick story'

The television programme *My Doctor* may seem to be a case too specific; yet, it not only reflected a common attitude towards disability, but was also all too well known by the rehabilitation hospital's current and prospective patients. Many patients we interviewed mentioned the episode where P1 was invited and said that they had decided to return to the hospital because of the 'robot' (P2,

P3). A physiotherapist we interviewed emphasized the same point about patients returning to the hospital after having heard about the miracles associated with the Lokomat (PT1).

In most cases, however, what lay ahead of the returning patients was quite different from what they had expected, because, as all doctors and physiotherapists agreed, the Lokomat did not have any direct recuperative effect on spinal injuries. It may be of help in cases of cerebral palsy (PT1), but for many patients hospitalized for spinal injuries it does not have a proven contribution to walking. Evidence levels are low (D1), and the system may seem to work for patients already walking (D2), or at least those with the potential to walk, as assessed after the patients' first examination at the hospital (D5).

Contrary to the patients' expectations, the Lokomat may provide other types of benefits, such as preventing arthritis or regulating blood circulation, but in itself it would not enable them to walk again. This fact usually remained unspoken because 'patient's expectations of walking are very high' (PT1, D1), and, if told that they would not walk again, they would abandon all efforts (D2), sink into depression (PT1, D1) or become aggressive (PT1). D2, for example, explained that she had been more realistic and open about patients' prospects of walking when she started working at the hospital, but that over time she began to think that it was better to 'leave things to time'. In her words, 'they are not fond of doctors who tell the truth'. As D1 and D5 also explained:

Even the fact that they see themselves standing up – the perception to be normal – has a very positive impact. It is very helpful in terms of motivation and one's psychological state of mind. [But it is true that the Lokomat presents] very low levels of evidence in terms of functionality. Do we openly admit that? It is not very good to tell patients everything [at the outset]. Hope is very important for them not to sink into depression. They do not want to hear it. (D1)

If you look at the foreign literature on the Lokomat, you see that it is prescribed for patients who have some potential for walking. We do an initial assessment of each patient's case upon arrival, which results in a categorization of patients as A, B, C, etc. The Lokomat is not for all levels, however. But usually we do not work like that here – it is rather patient satisfaction that is taken into account. Patients are very curious about it. We use it to increase motivation. Without much expectation, we prescribe ten sessions, just so that they do not lose motivation. (D5)

D5 perceived this as a waste of scarce resources, since there was just one Lokomat and only two physiotherapists authorized to operate it. Under the current conditions, patients had to wait a couple of weeks, sometimes up to one month before being able to use the device, meaning that patients who would actually benefit more lost valuable time (D5). However, due to the worries explained above, this concern did not develop into an integrated hospital policy, and different interviewees responded to patients expressing their enthusiasm for the Lokomat with varying attitudes (D2). According to another person employed in an administrative position, himself in wheelchair, this lack of an overall policy partly revealed doctors' preconception about becoming disabled in Turkey:

Unfortunately there is no psychological or psychiatric support as part of the doctor-patient relationship. Hence the attitude of 'If only I could get to ride this robot for a month! I'll get going immediately'. They exaggerate the use of the robot; in fact, it is not that much. It is a mechanical issue. No one says within the first year of the rehabilitation: 'Brother, you broke your spine, it may be your fault, or someone else's, but now you should face this, forgive yourself or the other person. It is not that you won't do anything any longer, life is more than two limbs, don't make it worse and try to be happy'. If doctors said so, people would be happier. Why are they reluctant to say so? Because they are afraid of reactions. They also expect the patient to walk. They also think that once one becomes disabled, her life is over [...] In fact, doctors also need rehabilitation. (NMS)

This situation is worsened by the commercialization of physiotherapy and other health services. According to P4, another ex-patient and current disability activist, a period of a couple of months is sufficient to teach a patient the necessary physiotherapeutic exercises, apart from exceptional cases. The former may continue the exercises at home, with the help of family and friends. But there is a massive amount of money that patients unhesitatingly invest in care and rehabilitation, which encourages the doctors, physiotherapists, and caretakers to keep the patients' hope of walking alive (P4). Patients are constantly told that 'the more effort you put in, the better is what you win' (P5).

This results in a vicious circle whereby patients are continuously directed to put effort into walking and are by no means prepared for a future adapted to disabling conditions, which in turn pushes them further to consider walking as the only viable option for a future worth living. As P4 explains:

There is nothing that 'wakes you up' there [in the rehabilitation hospital]. There are a thousand things that make you think that this process, that what you are going through, is right. That's how you think: 'I am getting cured. I need physiotherapy to get cured'. You try very hard. Try hard what? You try to walk. The possibility for you to walk is in fact 1 percent. But a thousand things that foster your dream of walking keep you busy. You got up with the help of a walker yesterday, let's see if you can do it with double walking sticks today, and then with a walking stick tomorrow. But in fact there is no change, no improvement in your bodily condition. You just try to stand up with sticks, like a circus monkey. All the exercises you do are of no help with respect to your daily life, in terms of functionality. You dream of walking, and they simulate your dream. It is a carrot-and-stick story. (P4)

The Lokomat serves to simulate this dream both symbolically and literally, through its virtual reality dimension. The patients' desperate endeavour to walk as well as the doctors' continuous reluctance to communicate with them openly on the issue are largely informed by the general attitude towards disability and the hardships associated with being a person with disability in Turkey. This situation is in line with our starting assumption – technology is not context-neutral, but may play different roles depending on the relevant sociocultural background. The following section summarizes the attitude towards and hardships associated with disability in Turkey in five points.

Outside the hospital: 'Do you think a disabled person can have a new life?'

First, accessibility is a major problem in the country; this is even more so the case in Istanbul, the most crowded metropolis of Turkey, where urban planning, architecture, infrastructure, and public transportation have almost never taken disability into account. Accessibility laws have been introduced without much legal enforcement, and municipalities remain inadequate in increasing accessibility standards in their districts (Bezmez 2013). This is important, as the degree of inaccessibility in the urban landscape shapes disabled people's conceptions of their lives in a wheelchair after rehabilitation, thus their approaches to 'walking' and expectations from the Lokomat.

Second, it is largely believed that persons who become disabled have reached the end of their life. This is partly related to the above-mentioned access problems and partly due to other structural problems (such as discrimination), but also largely informed by the idea that persons with disabilities are 'half-persons', that they cannot work, love, in fact, live again. As NMS, himself being a wheelchair user, explained:

Do you think that a person who becomes disabled can have a new life? A person with disability, for our society, is one who has to remain at home, trying to survive on the few pennies she is granted by the state [...] It is her family who makes all of her choices, she lives with them, never goes out, and communicates with others, only over the internet, only if possible. (NMS)

Stigmatization associated with the disabled body is also very strong. Many people using walking sticks (P6) or wheelchairs (P7) stress their hesitation to become visible on the streets. P1, for instance, explained why he was reluctant to socialize with other wheelchair users in his neighbourhood:

Normally when you are out there in your wheelchair they look at you with one eye; when you are two, three people in wheelchairs, they look at you with five-six eyes ... I don't like this ... (P7)

Once again, the stigma associated with the disabled body pushes people to think that a satisfying future life is only possible with walking. This situation is worsened by the fact that the disability movement in Turkey is very weak and far from adopting a rights-based approach (Bezmez and Yardımcı 2010). Instead, many relevant associations and non-governmental organizations form charity-based relationships with the state to remain under the latter's 'protection' (Bezmez and Yardımcı 2010, 606). Thus, as a third point, the chances to develop a disability rights perspective through an encounter with the disability community remain relatively slim, and patients' discourses continue

to reflect the existing disabling ideologies, especially the 'personal tragedy' approach, which reinforces a reliance on the 'curing' effects of technology.

The weak rights-based perspective also has repercussions for professional–laypeople relationships within the hospital, although the historical authority of the medical profession in Turkey has been in jeopardy lately (Dole 2004; Terzioğlu 2008). Despite a range of factors (eg privatization of medical schools, diminishing quality of medical education) that have led to the questioning of doctors' authority, the field of medicine seems to have found new ways of recreating such authority, especially through an increasing medicalization of everyday life (Özbay, Terzioğlu, and Yasin 2011, 20). Thus, as a fourth factor, one may refer to the passivity of the patient figure, expected to comply with the medical discourse (Erol 2008, 210), which imposes its own standards of normality.

Last but not least, the central role that patients' families play, both during rehabilitation and in its aftermath, is key to understanding why they are pushed to struggle to walk. As NMS summarized, 'in general, it is the family that draws the main contours of a disabled person's life'. This has benefits as well as drawbacks. On one level, the family provides indispensable support in a context where social services fail to facilitate an independent life. On another level, however, families often reflect the disabling ideologies of society, including its emphasis on the normality and importance of walking (Bezmez and Yardımcı 2015).

Conclusion

Drawing on the case of a robotic gait training device (Lokomat) recently installed in one of Turkey's major rehabilitation hospitals, this paper has tried to critically investigate the role that technology plays in rehabilitation. Within this scope, the media appearance of the device was analysed, and several interviews – conducted with former and current patients as well as medical and non-medical staff at the hospital as part of a larger fieldwork – were revisited with a special focus on how this device was perceived and presented.

The combined study brought to the fore the following points: (1) the arrival of the Lokomat created a renewed interest and enthusiasm among former and current patients of the hospital, since the device was perceived as a development that could miraculously make non-walking patients walk again. (2) This perception was kept alive by (a) misleading media coverage and (b) the fact that the scope and limitations associated with the Lokomat could not be openly discussed between patients and medical staff. (3) This lack of communication was largely due to the medical staff's reluctance to disclose to patients that the possibility to walk again was virtually non-existent. (4) This reluctance stemmed from the socio-economic and cultural conditions surrounding and shaping the experience of disability in Turkey, where, for the reasons summarized above, a 'normal' life is equated with walking.

It was in this context that the Lokomat arrived at the hospital and was unavoidably surrounded by a discourse of normalization. Within a context where patients were continuously directed to put effort into walking and by no means prepared for an independent future adapted to disabling conditions, the Lokomat could only find meaning as a device oriented to and emphasizing the purpose of walking, in accordance with Moser's (2006) prior argument. Its presence and use only reminded the patients of the possibility, necessity and normality of walking, and it was praised only to the extent that it kept this hope alive.

The social study of rehabilitation is underdeveloped, and most work emerges from the field of rehabilitation sciences.⁴ Furthermore, as the literature review has demonstrated, disability studies scholars focusing on the role of technology have neglected the study of rehabilitation technology. This is an important gap: As Oliver ([1996] 2009) has argued, rehabilitation is an essential field in which bodily normality can easily be reproduced. Moreover, it often involves a time-period when people are in the initial stages of their disablement and thus introduced to disability for the first time. Hence, the way in which technology is conceptualized and experienced during rehabilitation has the potential to shape the experience of disability to an important extent. This paper thus

aims to contribute this point to the existing literature and to initiate further research into the social study of rehabilitation more generally and technology more specifically.

Notes

1. Robotic gait training is accomplished with a device called 'Lokomat' (Hocoma AG; Volketswil, Switzerland). Hidler et al. (2008) describe the Lokomat, developed in late 1990s, as follows:

[A]n exoskeleton that attaches to the outside of the subject's legs and assists the subject as he or she ... ambulates on the treadmill. Small direct current motors drive the hip and knee joints while dorsiflexion is provided at the ankle with two elastic straps. (338)

According to the literature, largely produced by people from rehabilitation medicine and biomedical engineers, one major goal in developing the Lokomat was to facilitate recovery (Krebs et al. 2008; Hidler and Lum 2011; Krebs et al. 2008 in Phelan et al. 2014, 2073). This recovery is strongly associated with functional development, especially concerning patient's walking ability (Hidler et al. 2008; Fasoli et al. 2012 in Phelan, Wright, and Gibson 2014), but as discussed below, the Lokomat's direct contribution in this respect remains debatable. The Lokomat is also expected to provide 'relief of physical burden for families and health care professionals' (Phelan, Wright, and Gibson 2014, 2073), because 'robotic devices can fill the gap in rehabilitation, where it is difficult and/or unsafe for a therapist to attempt to deliver a particular type of therapy' (Hidler and Lum 2011, vii). There is an additional virtual reality dimension attached to this device, where in our case patients could watch their simulation in the form of a walking person as they practiced on the treadmill. The rationale for the use of this virtual reality dimension is explained as to 'stimulate motivation and engagement in rehabilitation' (Lewis and Rosie 2012, 1884).

2. This finding is also in line with Oliver's early work (Oliver [1996] 2009) on the construction of 'walking' in rehabilitation, where he argued that 'rehabilitation constructs the concept of walking uncritically ...' (36), because 'the ideology of normality permeates most rehabilitation practice ...' (38).
3. Numbers are taken from the following web portal reportings about *My Doctor*: <https://www.kanald.com.tr/doktorum/haberler/doktorum-yeni-sezona-basliyor/36329.aspx>, http://www.hurriyet.com.tr/pazar/15868308_p.asp, <http://www.medyaradar.com/doktorumun-sunuculari-degisti-yeni-donemde-kimler-sunacak-haberi-104143>
4. We owe this point to our conversation with Tom Shakespeare.

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