



Robotics for Good Care

OPINION

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1 PROBLEM OUTLINE

Technological developments are gaining increasing importance in the discourse on the development of nursing care. The German Ethics Council holds the view that this discussion should not focus exclusively on the question of how nursing staff can be supported and relieved from pressure by means of technical assistance, but it also needs to deal with the relevance of new technical products for the further development of nursing care, for example an orientation towards a more activating or rehabilitating care. Technological systems should not replace interaction in nursing care, they should complement it. The crucial factor for deciding in what manner and to what extent technical products – also robotics products – shall be used in care must be the well-being¹ of the people in need of care or assistance.

The growing number of people requiring assistance and care – among them many who suffer from some form of dementia – is a challenge for society and for allocation policy. In 2017, approximately 3.4 million people classified as being in need of care (within the meaning of the *Pflege-Versicherungsgesetz*, SGB XI [Long-Term Care Insurance Act, Book XI of the Social Code]) received care, provided by altogether 1.15 million staff in nursing care services and four to five million family caregivers.² Even today, there is a shortage of nursing staff, and forecasts predict an accentuation of the problem in the future.³

For a number of years now, there has been the hope of reducing the discrepancy between nursing demand and available nursing staff with the help of technological developments.⁴ The workload in nursing homes and on nursing wards should

1 On the category of “well-being” cf. Deutscher Ethikrat 2016, 37–62.

2 Cf. Statistisches Bundesamt 2018, 8, 23, 35; Wetzstein/Rommel/Lange 2015, 8. About three quarters of care recipients are being cared for in their homes by out-patient care services, one quarter lives in in-patient care facilities (cf. Statistisches Bundesamt 2018, 18).

3 Cf. Szepan 2019, 37.

4 Cf. Kehl 2018, 49.

be eased by enabling people to keep living independently in their familiar environment for a longer period of time thanks to service robots.⁵ In addition, both informal and professional caregivers in the in-patient as well as the out-patient sector can be supported by robotic systems in physically demanding or repetitive and time-consuming tasks.⁶ Politicians promote the development of corresponding technologies with extensive programmes. For example, in the context of the programme “Zukunft der Pflege: Mensch-Technik-Interaktion für die Praxis” (The future of nursing care: Human-technology-interaction in practice) a nursing care innovation centre and four centres for nursing practice will be subsidised up until 2022 to test robot technology, among others.⁷ In a directive on the promotion of research and development in the field “Robotische Systeme für die Pflege” (Robotic systems for nursing care) published in 2018, the Federal Ministry of Education and Research (BMBF) emphasises: “It must be assumed that the needs for nursing care will rise, while at the same time the shortage of professional nurses will increase. Against this background, robotic systems are assumed to have the potential of contributing to a relief in everyday care by providing situation-adapted support.”⁸ However, only few of the government-funded new technologies have reached market maturity so far.⁹

The hopes for a positive impact are contrasted by considerable concern. For example, fears persist that people in need of care or assistance might receive less social and emotional support due to the use of robot technologies,¹⁰ that they might be limited in their privacy and liberties,¹¹ that they might be

5 Cf. Janowski et al. 2018, 64.

6 Cf. Merda/Schmidt/Kähler 2017, 71 ff.

7 Cf. the BMBF press releases 056/2017 (<https://www.bmbf.de/de/pflege-von-angehoerigen-und-patienten-erleichtern-4279.html> [2020-01-15]) and 001/2018 (<https://www.bmbf.de/de/meilenstein-fuer-die-zukunft-der-pflege-5376.html> [2020-01-15]).

8 Bundesministerium für Bildung und Forschung 2018a.

9 Cf. Kehl 2018, 89.

10 Cf. Sparrow/Sparrow 2006, 152.

11 Cf. Sharkey/Sharkey 2012a, 270 ff.

deceived or infantilised.¹² Professional nurses feel threatened by a modification of their occupational image towards a less relationship-oriented care model.¹³ In the face of limited resources, fears arise that financing technical assistance systems could hamper improvements for nursing staff like higher remuneration, lower work density and a generally higher appreciation of the caring profession.

Nevertheless, according to a representative survey of the Zentrum für Qualität in der Pflege (Centre for Quality in Care), the attitude of the general public towards the “use of a hypothetically technically mature robot” is quite positive. Three quarters of the respondents approve of employing such a robot as a reminder to take one’s medication, to eat or drink, and 65 percent approve of robots as assistance for getting up after a fall. Approval of robot assistance decreases as the intimacy of the task increases. Still, half of the respondents agreed to robots assisting when care recipients go to the toilet.¹⁴ Another study shows that acceptance of technological assistance systems among professional nurses depends on the tasks for which they are used. Technical assistance in physically demanding care work or for care documentation purposes is perceived as supportive, whereas technological support in the social or emotional sphere of care work is seen rather critically.¹⁵

Also, various bodies providing counsel in politics have dealt in depth with weighing the risks and benefits of an increasing technologisation of nursing care activities. To mention but the latest publications in the German-speaking regions: In 2018, the Bioethics Commission at the Federal Chancellery in Austria submitted an Opinion with the title “Robots in the Care of Older People”. In its recommendations, it calls for the “perception of the diversity of older people and their needs”, easy configurability of robot applications that is adequate to

12 Cf. Sharkey/Sharkey 2012b, 35.

13 Cf. Kuhlmeier et al. 2019, 22.

14 Cf. Eggert/Sulmann/Teubner 2018, 4.

15 Cf. Zölllick et al. 2020, 212.

changing practical needs, and appropriate data protection.¹⁶ In the same year, the Büro für Technikfolgen-Abschätzung (Office of Technology Assessment, TAB) at the German Bundestag published its comprehensive study titled “Robotik und assistive Neurotechnologien in der Pflege – gesellschaftliche Herausforderungen” (Robotics and Assistive Neurotechnologies in the Care Sector – Challenges for Society). In this paper, the discrepancy between the expectations surrounding robotics in the care sector and the achieved potential for solutions is illustrated.¹⁷ Its authors warn of making generalised assessments. They claim that the practical implications of technological developments have not yet been sufficiently understood in order to define appropriate ethical and legal standards.¹⁸

The German Ethics Council takes up this discourse and focuses on the ethical appraisal of robot technologies used in care for elderly people, as well as younger people with a lasting, severe disability. There is need for a systematic analysis illustrating possible ethical problems linked to employing robot technologies in nursing care processes and differentiating between a micro-, meso- and macro-level (see section 4) in the exposition of these problems and in the elaboration of possible solutions. It is so significant because nursing care and comprehensive assistance is mainly given to people who are regarded as being particularly vulnerable in physical, cognitive and/or emotional respects, and who for this reason are in a comparatively weak position when it comes to articulating and enforcing their claims and needs. A differentiated ethical analysis of the potential as well as the risks of the use of robots is important especially in view of these highly vulnerable groups of persons.

The Opinion deals with the issue of robotics in nursing care. However, the use of the terms *nursing robot* or *robotic*

16 Cf. Bioethikkommission beim Bundeskanzleramt 2018, 21.

17 Cf. Kehl 2018, 198.

18 Cf. *ibid.*, 200 f.

nurse shall be avoided, as they could be misunderstood as a prediction that robots would act on an equal level with human nursing staff, or even replace them. The German Ethics Council is convinced that such a scenario is neither realistic, nor is it desirable. As far as the feasibility of fully-fledged robotic nursing staff is concerned, it must first of all be noted that its appraisal does not only depend on technological progress, but also on terminological preliminaries. It is unclear, and many people doubt whether it makes sense to describe a robot's external behaviour in terms of human action, its reactions to external stimuli in terms of mental states, and its interactions with people in terms of personal communication. The catchword of the pertinent debate is "anthropomorphism". In this context, the question whether robots could be capable of nursing in the proper sense of the word first of all refers back to the more general question whether it is adequate to describe their behaviour as "acting". Looming in the background are complex problems of the theory of action and the philosophy of mind, e.g. whether future robots must at some stage be possibly attributed a *consciousness* or *mental states*, or whether their activities would need to be described as *rational* or *intentional*. These issues cannot be adequately treated in this Opinion. At this point, it should merely be highlighted that the ability to pursue autonomously set goals is an ethically and legally particularly important feature of human subjects of action, which at least for the time being is clearly not present in robots. The point of departure for the present considerations therefore is the conviction that there is now, and will be for the foreseeable future, a categorical difference between humans and machines, which may not be blurred (including linguistically): Only persons qualify as subjects of moral actions and therefore as bearers of responsibility.¹⁹

19 Cf. Bendel (2019, 309), by contrast, who asks "whether the care robot should possess moral capabilities" and answers, at least partially, in the affirmative.

Pursuant to Immanuel Kant, human action can also be perceived as an expression of personhood if it is not understood as an isolated, goal-oriented event, but as an object of mutual normative imputability.²⁰ Individual persons can be held accountable for their actions both morally and legally, because they have *moral autonomy*. It is true that self-learning robotic systems can, in some sense, “independently” select the means to achieve a given purpose, insofar that they manage to reach certain targets set to them in new ways that their developers might not have expected. However, they do not possess the competence that is relevant for moral autonomy, i.e. responsible *choosing of goals*. Independent of the question whether such competence of setting goals would be technically feasible, it must be stated that it would not be desirable, because the robots endowed with such competence may set themselves purposes whose implementation might possibly appear immoral to their human developers, and even be dangerous in the context of nursing care.²¹

In complex courses of action with several individual and collective players where technical products are used for the purpose of functional enhancement or of significant relief for humans, three insights therefore appear to be especially important from an ethical point of view: Firstly, reflections on a positive interplay of human being and machine requires a *comprehensive* approach, especially in the context of sensitive and intimate care activities to and with particularly vulnerable groups of persons. In this process, not only should the use of robotic systems be considered against the background of the special needs of and threats for all the relevant stakeholders in the area of care. Rather, already the technological development of such systems should be critically monitored from the start,

20 “A Person is a Subject who is capable of having his actions imputed to him” (Kant 1887, 31 [AA VI, 223]).

21 Cf. Christaller et al. (2001, 220): “In the contexts of robotics, it must be maintained that the competence of setting goals is principally reserved for persons.”

and the setup of designer, user and product should be seen as a functional unity. Secondly, the various forms and levels of responsibility underlying these processes must be distinguished from one another. In order to prevent an erosion of responsibility, it is necessary to establish transparent structures of responsibility, where both individual and collective responsibilities are clearly identifiable and the actual assumption of responsibility can be effectively controlled. Thirdly, it must be stated in view of the provision of high-quality nursing services that robot technology essentially represents a *complementary*, not a *substitutive* element in nursing care and always must be embedded in interpersonal relationships.

2 CURRENT DEVELOPMENT AND FUTURE POTENTIAL

Major progress has been made in the development of nursing technology over the past years. Under the general headline Care 4.0 various focus technologies are being discussed, from electronic documentation via AAL systems (Ambient Assisted Living), telecare and telepresence medicine to robotics. The latter shall be in the centre of the present Opinion, because it is considered as particularly promising for managing the increasing challenges in nursing, and because it can provide stimuli for economic development.²² The diversity of robotic technologies for the nursing sector at various stages of development cannot be described and appreciated in detail in this paper.²³ Its intention is rather to present an outline for the classification of robotic applications in care, in order to define more precisely the aspects of the ethical analysis.

The difficulty to conceptually distinguish robot technologies from a series of other technological systems exists not only in the care sector. There is no generally acknowledged understanding of what it is that specifically defines a robot.²⁴ In the early years of robotics, the so-called “sense-think-act paradigm” was commonly used to define the term. However, it is controversial whether robots can sense, think or act in a more

22 Cf. Görres/Böttcher/Schumski 2019, 144.

23 On the occasion of its Annual Meeting 2019 “Care – Robot – Ethics. Ethical Challenges in the Technologisation of Care”, the German Ethics Council not only dealt with the normative issues treated in the present Opinion, but also became familiar with the technological state of the art. In this context, the practical parcours “Robotics in Nursing Care” deserves particular mention, in which selected showcase projects presented their robotic applications. The comprehensive multimedia documentation of the Annual Meeting can be accessed online at <https://www.ethikrat.org/jahrestagungen/pflege-roboter-ethik-ethische-herausforderungen-der-technisierung-der-pflege> [2020-01-15]. In addition, the TAB report mentioned above (Kehl 2018) offers a detailed overview of the current state of development of robotic care applications.

24 Cf. Kehl/Coenen 2016, 100.

than metaphorical sense. At least it should be considered a characteristic of robots that they receive sensory information of some kind, process it and carry out activities on the basis of this information, in order to bring about pre-defined target states in their environment. Helpful orientation is provided by the definition for the purposes of ISO standard 8373, which has been elaborated jointly by the International Federation of Robotics and the United Nations Economic Commission for Europe (UNECE). According to this definition, a robot is an “actuated mechanism programmable in two or more axes with a degree of autonomy, moving within its environment, to perform intended tasks.”²⁵ Autonomy in this context means the “ability to perform intended tasks based on current state and sensing, without human intervention.”²⁶ By using the term autonomy, this definition sounds anthropomorphic, too, yet the explanatory adjunct that a robot’s functionality is merely characterised by a certain degree of independence of human control refutes this apparent conceptual inadequacy. According to the classification of the International Federation of Robotics, robots in the medical context are specified as service robots. With regard to the robots of interest here in the care sector, a distinction must be made between those for the personal use (in private households) and those for professional use (e.g. in a clinical setting).

Robotic applications in the context of care for the elderly, summarised under the terms of geriatrics or gerontechnology, are usually subdivided depending on the function they fulfil. Following is the functional differentiation suggested by Amanda and Noel Sharkey. They distinguish between robots assisting seniors or people with a disability (assistive robots), robots monitoring actions or body functions (monitoring robots), and robots serving as a companion (robot companions).²⁷ Even if robotic systems increasingly integrate various

25 <https://www.iso.org/obp/ui/#iso:std:iso:8373:ed-2:vi:en:term:2.6> [2020-01-15].

26 <https://www.iso.org/obp/ui/#iso:std:iso:8373:ed-2:vi:en:term:2.2> [2020-01-15].

27 Cf. Sharkey/Sharkey 2012b, 27 f.; in the field of mental health cf. Fiske/Henningsen/Buyx 2019.

functions, as is the case particularly with new developments, this classification still serves its purpose, because the different functions correlate to specific potentials and risks.

Assistance

The term assistive robot subsumes a number of systems of various kinds that support carers and care recipients in their everyday tasks. In current practice, especially fairly simple systems limited to *one* service only are relatively widely used.²⁸ For example, there are robots helping in food intake or body hygiene. Assistive robots also include “intelligent” transport systems that support nursing staff on the ward by independently following specific routes and providing or collecting medication or laundry items, for example. Lifting aids assist carers in physically demanding activities like positioning patients at a higher level or transferring them from the bed.

Among the mobility assistants are robotic walking frames, wheelchair-based applications with prosthetic extensions, and exoskeletons. Exoskeletons are assistive systems worn on the body which support or reinforce body movements and have a mechanical effect on the body. Today they are used for patients with spinal cord injuries, among others. They are still in an early stage of development, but are considered as promising technologies.²⁹ They may also be used by carers, who can use them as lifting aids that relieve them of physical strain, for example.³⁰ According to forecasts, there is a “trend [...] towards intelligent systems that can learn from observing their environment and generate decisions.”³¹

Service robotics is sometimes accused of underestimating the emotional, interpersonal importance of the so-called “dull and dirty tasks” like cleaning, lifting and carrying people that are meant to be carried out primarily by robots. According to

28 Cf. Bedaf/Gelderblom/de Witte 2015, 97.

29 Cf. International Federation of Robotics 2019, 11 f.

30 Cf. Kehl 2018, 85 f.

31 Cf. Beck et al. 2013, 1.

Sharkey and Sharkey, it is these tasks in particular that require and promote the interaction and the trust between care recipients and carers.³²

Monitoring

Technologies with the purpose of monitoring, sometimes critically referred to as electronic care surveillance at an international level³³, may be of considerable importance for preserving self-determination in old age, as they are aimed at enabling people with increasing need of care to remain in their familiar surroundings for a longer time.³⁴ Even if it is not always possible to make a clear distinction here, robotic monitoring technologies can be distinguished from AAL systems by the fact that the first group can move around the home independently or by remote-control.³⁵ Telepresence systems enable professional nurses and medical staff to remotely monitor health-related body functions as well as social interaction with reference persons.³⁶ Some monitoring systems can remind people with memory deficits of everyday tasks (taking medicine, eating, drinking, going to the toilet etc.). If the options for interaction go even further, it might make sense in many cases to talk of assistive robots or robot companions with integrated monitoring functions.

The positive effects of monitoring systems for promoting a self-determined lifestyle is offset by risks for privacy and intimacy which affect not only care recipients, but also caregivers.³⁷ Moreover, the shift from personal contacts to the virtual world that is possible through telepresence systems may lead to a loss of immediate closeness and thus to solitariness. In addition, it must be considered that especially with regard to

32 Cf. Sharkey/Sharkey 2012b, 29.

33 Cf. Essén 2008.

34 Uddin/Khaksar/Torresen 2018 offer a comprehensive overview.

35 Cf. Graf et al. 2013, 1145.

36 Cf. Ziegler/Dammert/Bleses 2018.

37 With regard to the risks for care recipients cf. Weber 2015, 253 f.; with regard to those for caregivers cf. Jenkins/Draper 2015, 678.

monitoring systems large volumes of data are created. It is a considerable challenge to securely process these data and protect them from abusive utilisation by third parties in order to safeguard the data sovereignty of people in need of assistance or care.³⁸

Company

Companion robots support social interactions or serve as interaction partners themselves. In contrast to other robotic systems in the area of care, they mainly meet communicative and especially emotional needs. Probably the most familiar and commercially most successful products in this field of application are robots in the shape of animals. These robots, that resemble seals, cats, or dogs, for example, react to touch or sound by making specific noises or movements, and some of them feature elements of speech recognition so that they can learn names, for example. Critics warn that such artificial companions would contribute to an “infantilisation” of elderly people and feign relationship-based action and emotional bonds.³⁹ Researchers increasingly object to this view and point out the self-determined way in which people deal with companion robots, even people suffering from dementia. For example, a study illustrated that people in an advanced state of dementia showed an interest in a robot dog in the sense that they watched it, spoke about it or talked to it, but hesitated to touch it.⁴⁰ International studies have proved that systems like the robot seal Paro or the robot dog Aibo contribute to boosting morale and reducing stress, particularly in dementia patients.⁴¹ In addition, they can alleviate feelings of solitude and in this way improve people’s quality of life. In order to achieve this,

38 On the concept of data sovereignty in dealing with health-related data cf. Deutscher Ethikrat 2017, 251 ff. and passim.

39 Cf. Sharkey/Sharkey 2012b, 35.

40 Cf. Tamura et al. 2004; Libin/Cohen-Mansfield 2004.

41 Cf. Kachouie et al. 2014; Banks/Willoughby/Banks 2008; Janowski et al. 2018.

however, it is important that robots are integrated into processes of direct interpersonal communication, instead of replacing it.⁴² Robots in the shape of animals should not replace live animals, which are successfully used in care and therapy, including for people suffering from dementia.⁴³

More sophisticated social robots that can assume a broad range of tasks and are intended to process not only various sensory stimuli, but even language, are currently in an early stage of development. They shall sometimes also be equipped with elaborate telepresence systems, in order to enable medical staff or relatives to provide (medical) care from a distance. There are high obstacles in the further development of this type of social robot: Even developing a system for speech recognition that can also cope with articulation disorders, as they can often be found in people in need of care, is an extremely complex task. Moreover, procurement and implementation costs for this type of robot are expected to be high, which is another reason why it is not very likely that they will be used in practice in the foreseeable future.

42 Janowski et al. (2018, 67) emphasise that especially the “embodiment” of social robots plays a major role in increasing their “credibility”. The authors argue that also the robots’ “capacity to interact with people in a socially appropriate manner” is decisive for their acceptance.

43 Cf. Otterstedt 2013.

3 “GOOD CARE” AS GUIDING CONCEPT

So far, little is known about the impact that the use of robots has on people in need of assistance or care. In addition, there are yet no answers to the question where robotic applications promote care in the sense of a social caring relationship that assists and supports people in managing their everyday life,⁴⁴ and where the use of robotics cannot fulfil these needs. In order to answer this question, it must first be clarified what the underlying principles of “good” care are.

Different people in need of care have differing ideas about what is good care. These ideas are closely linked to their various beliefs and value preferences about what makes life overall *good* and *meaningful*. While for some people in need of care it is essential to receive care in close social relationships with empathic attention, or at least *human* care, other people desire to be able to lead an autonomous life with the help of technological assistance and without the support of other persons, as far as possible. Likewise, various stakeholders will have different priorities when it comes to defining good care. For financing organisations, efficiency and effectiveness in the sense of economical management (cf. Section 84 (2) SGB XI) will possibly be essential features of good care. Caring family members (“relatives”) and caring friends or neighbours (“relations”) will most likely measure good care in relation to the contentment of the care recipient. The professional nurses’ definition of good care will depend on the compliance with professional standards.⁴⁵

44 For a more precise description of care as a caring relationship cf. Deutscher Ethikrat 2018, 42–47 for details.

45 Professional standards of quality are being developed especially by Deutsches Netzwerk für Qualitätsentwicklung in der Pflege (German Network for Quality Development in Nursing) and laid down in specific auditing instruments (<https://www.dnqp.de/de/expertenstandards-und-auditinstrumente> [2020-01-15]). However, a corresponding instrument for the use of robotics in nursing care is yet missing.

These professional standards of good care are normatively demanding. They reflect an ethical self-understanding of the caring professions that is enshrined in the “Charter of Rights for People in Need of Long-Term Care and Assistance”⁴⁶ or in the “ICN Code of Ethics for Nurses”⁴⁷. The latter says that “inherent” in the four responsibilities of nursing (“to promote health, to prevent illness, to restore health and to alleviate suffering”) is a “respect for human rights, including cultural rights, the right to life and choice, to dignity and to be treated with respect” (preamble). The United Nations Convention on the Rights of Persons with Disabilities⁴⁸ underlines the general principle of “respect for inherent dignity, individual autonomy including the freedom to make one’s own choices, and independence of persons” (Article 3 a) and calls for the support that is necessary to exercise these rights (cf. Article 12 (3), for example).

The “Charter of Rights for People in Need of Long-Term Care and Assistance” is being continuously developed by the “Runder Tisch Pflege” (Round Table for Long-Term Care) since its first version in the year 2007. It specifies in detail some of these crucial rights and uses them as a basis to develop a differentiated set of standards for professional and non-professional care. According to the Charter, the right to self-determination and self-help support comprises not only the choice of the provider of care, support and treatment services, but also what form the services provided should take (Article 1), which includes the use of assistive technology. The right to “physical and mental integrity, freedom and security” is intended to protect from “harm caused by poor or inappropriate medical treatment and care” (Article 2). The right to privacy highlights in particular the “consideration and respect” of the “privacy and intimate personal space” that needs to be expressed by

46 Bundesministerium für Familie, Senioren, Frauen und Jugend 2019.

47 International Council of Nurses 2012.

48 Übereinkommen über die Rechte von Menschen mit Behinderungen (BGBl. 2008 II, 1419, 1420).

respecting the “sense of modesty” and by protecting “personal data” (Article 3). Overall, every person in need of care has the right to patient-centric “dedicated care” that is taking account of their “needs, background and previous experience, abilities and impairments or limitations” (Article 4).

The call for respect and support of self-determination is gaining more and more importance in the various contexts of care – particularly in such contexts where people need long-term assistance due to a physical, mental, psychological or sensory impairment, but do not want to rely on the permanent presence of a caregiver. Under the catchword of personal assistance, this trend gives priority to the subjectivity and sovereignty of the care recipient: Persons in need of support shall be given the opportunity to organise their lives according to their own wishes, preferences and needs. Like nursing care, personal assistance includes all areas of everyday life with a need to support. Pursuant to Section 78 SGB IX, assistance, like nursing care, comprises support services in everyday life. These include, for example, help in household chores, organisation of daily routine, leisure activities and social participation. The decisive difference to traditional ideas of care is that it is the person concerned who takes the initiative and who decides on how their help shall be organised. The claims made by the United Nations Convention on the Rights of Persons with Disabilities in favour of the disabled can be found again in the “Charter of Rights for People in Need of Long-Term Care and Assistance” in Article 1 under the terms “self-help support” and right “to assistance to enable them to live a life which is as self-determined and independent as possible”. In this way, the idea of assistance also characterises – at least conceptually – the contemporary understanding of care. Care, just like any other “supportive relationship”, ideally intends to enable people in need of care to integrate offers of personal or technical assistance into their own way of living and managing everyday life, or to reject it. In this manner, their independence becomes apparent.

Focussing on the promotion of independence by means of assistive care counters a blanket judgement in the appraisal of a person's dependency on care, both in view of its extent as well as in view of its duration. Dependency on care can, but does not necessarily have to include a comprehensive loss of abilities and functions and, as a consequence, make comprehensive care and assistance indispensable. What is more, dependency on care does not have to be irreversible. It has become evident that even after a longer-term dependency on care (operationalised through care degrees in social law), the use of rehabilitation strategies can lead to a significant improvement of existing limitations in abilities and capabilities.⁴⁹ By contrast, a care concept that takes away as many activities and actions as possible from a person, will make it much harder to maintain or regain independence and self-determination. Research in care keeps pointing out this danger time and time again.⁵⁰

A differentiated view of both the limitations as well as the resources of a person shows that care should always be understood in a sense of assistance, too: Such assistance is provided with the aim of compensating for irrevocable restrictions and limitations, but also with the aim of motivating and helping a person to autonomously and self-determinedly use those abilities and capabilities that are largely or at least partly preserved. It is absolutely feasible that in areas where primarily a compensation or activation of practical functions in everyday life is required, this assistance is provided with the help of assistive robotics. Under certain circumstances, robotic systems might also be a means to promote the potential for change and adaptation (plasticity) and to rebuild abilities and capabilities that have been lost, e.g. by rehabilitation. To the extent that these technologies have a truly activating effect, they may possibly even contribute to a significant expansion of the range of abilities and capabilities.

49 Cf. Kruse et al. 2019, 250 ff.

50 Cf. for example Kümpers/Wolter 2015; Blüher/Kuhlmeiy 2019.

Even if different interpretations of good care are considered, it can be stated that good care primarily⁵¹ comprises two different tasks. Most importantly, there is the preservation, re-establishment or promotion of the physical, mental, psychological or sensory functions that are indispensable for a person in need of care or assistance in order to manage their everyday life in a satisfactory manner (including everyday tasks like body hygiene, food and drink, mobility or keeping the household, for example) and especially in order to lead a self-determined life. Independence includes various dimensions: Apart from the ability to self-determination, it is most of all life in a homely environment and familiar everyday world. Today, good care is evidence-based. It relies on scientifically substantiated and ethically as well as legally legitimised practical routines. At the same time, professional care work is a “person-centric service with particularly close personal relatedness.”⁵² Its counterpart is not a material object, but a human subject. As such, the receiving person is involved in various ways in the provision of good professional performance, as is the case with every person-related service.⁵³ First and foremost, this pertains to the immediate situational feedback on the specific individual preferences and options of the care recipient. It is only by way of this interactive response⁵⁴ that care work receives its “internal evidence”, apart from the “external”, scientifically based evidence.⁵⁵ This is why good care is always at the same time care in an and of an interpersonal relationship. This aspect of care has a specific *physical* dimension, in which its particularly close personal relatedness becomes manifest: in the bodily and facial expressions of both the care recipients

51 Apart from these primary or immediate tasks, professional care also includes activities in the field of advocacy, research or healthcare policy (cf. <https://www.icn.ch/nursing-policy/nursing-definitions> [2020-01-15]).

52 Hülksen-Giesler/Daxberger 2018, 128.

53 Cf. Lob-Hüdepohl (soon to be published).

54 Following Joan Tronto, care ethics talks of responsive care receiving (cf. Conradi 2001, 40 f., 45 ff.; Lob-Hüdepohl 2012, 394 f.).

55 Cf. Hülksen-Giesler/Daxberger 2018, 129 with reference to Ulrich Oevermann.

and the caregivers, in their gestures and the haptics/tactility of their respective body language.⁵⁶

Non-verbal, bodily-mediated “communicative work, relationship building and emotional labour”⁵⁷ is also at the core of good care. The function-oriented mobilisation of a person in need of care, e.g. from bed to wheel-chair, always also comprises a socio-emotive aspect, for which bodily-mediated care work is indispensable. The socio-emotive aspect might consist of communicating information verbally and gesturally, or maybe of communicating in a calming and reassuring manner, when using a lifting robot. Conventional bodily interaction, often used to convey tranquillity or build trust, might be lost when using technology. On the other hand, avoiding such physical closeness of the carer might be experienced as a relief or protection of one’s modesty, for example in intimate hygiene. In this way, separating the functional part of care from the physical presence of a carer in certain situations is particularly suited for relationship building between the various actors, because it creates room for a relationship characterised by both closeness and distance that corresponds to the well-being of the person in need of care and is defined by them. Caregivers, for their part, benefit from considerable relief through the help of a lifting robot, which can enable them to focus more on the socio-emotive dimension of care when carrying out mobilisation activities. This is in the interest of good care. However, problems may occur if the use of technical assistive systems gives rise to the fear that the desired socio-emotive core of care work is meant to be curbed, subdued or even replaced.⁵⁸ This would go against the professional requirements of good care and would raise further ethical questions.

The requirements of expertise in good professional care in principle also apply to care work done by relatives and

56 Cf. Remmers 2016; Remmers/Hülsken-Giesler 2012.

57 Hülsken-Giesler/Daxberger 2018, 129.

58 Cf. Manzeschke 2019, 5.

relations (caring communities)⁵⁹, which can be supported by professional nurses. Demands on relatives and relations must of course be limited to the measure of work that can reasonably be expected and asked of them, given their own everyday work and lifestyle. Nevertheless, relatives and relations often feel that care is a heavy burden, time-wise, physically, or mentally.⁶⁰ This is especially the case if the care work is long-term, if it must be provided over a distance,⁶¹ or if the degree of care dependency steadily increases. In overload situations, the social intimacy of care furthermore harbours the danger that caring relatives lose control of their own actions and react inappropriately.⁶² This is why it is especially in this area of care that the issue of technological assistance by robots might be an option to maintain or even promote care constellations that are close to the person's familiar life environment. For some people in need of care, technological assistive systems could contribute to reducing their dependence on the immediate presence of other people, to helping them to determine more strongly the ratio of closeness and distance in caring communities according to their own preferences, and to reducing the dangers resulting from a direct dependence on others.

59 Cf. Bundesministerium für Familie, Senioren, Frauen und Jugend 2016, 214 f.; Klie 2014.

60 Cf. Gräßel/Behrndt 2016, 174 ff.

61 Cf. Franke et al. 2019, for example.

62 It is not rare that this applies also to the neighbourhood environment of caring communities, to which the immediate family members and friends turn in the hope for relief. Cf. Orfila et al. 2018.

4 ETHICALLY RESPONSIBLE USE OF ROBOTICS IN NURSING CARE

In order to responsibly develop the process of step-by-step utilisation of robotic systems in increasingly sensitive areas of life it is not only necessary to adequately consider the needs and abilities of the care recipients and caregivers involved, but also to distinguish between different dimensions and levels of responsibility.⁶³ To meet both requirements is a demanding task with regard to people in need of assistance and care.

Care is a process of complex interaction that is closely linked to basic human needs which are fulfilled (primarily) through contact with other people⁶⁴ (e.g. well-being, identity, self-determination, relatedness and protection of intimacy). From a normative perspective, the needs mentioned here at the same time essentially refer to elementary conditions of the human being. As such, they in turn represent important substantiations of human dignity as a major ethical concept of orientation.⁶⁵

Acknowledging and respecting these basic needs as comprehensively as possible first of all concerns the specific interaction between the respective caregiver and the care recipient. If possible, they should decide together whether and to what extent robotic elements should be integrated into certain nursing processes and patient activation measures (micro-level of responsibility). “Deciding together” means shared decision-making: jointly, the persons involved search for and come to a decision. It is the care recipient who ultimately bears responsibility for taking the decision.⁶⁶ Since providing care

63 Cf. Ricken 2010, 98–101; Bormann 2014.

64 Cf. Coeckelbergh 2010; Vandemeulebroucke/Dierckx de Casterlé/Gastmans 2018.

65 Regarding human dignity as an ethical concept of orientation, see Deutscher Ethikrat 2019, 111–114.

66 Cf. Deutscher Ethikrat 2018, 39.

services and developing and offering robot technologies depend on different institutional requirements, the management of competent care facilities or mobile nursing services as well as the developers and distributors of robotic systems also bear a specific responsibility (meso-level). In the end, however, also these institutional stakeholders act within a systemic framework on which they themselves have no influence and which points to the responsibility of politicians and administration for health policies and especially of the health care system's self-administration (macro-level). The following considerations attempt to develop the respective ethical aspects that are most important for each of these levels. As these three levels differ substantially from one another with regard to the diversity and complexity of their ethical challenges, the breadth of their coverage differs correspondingly in the following section.

4.1 Micro-level of responsibility

With the aim of organising the direct interaction between carers and persons in need of assistance or care in a responsible manner, it seems appropriate from an ethical point of view to provide orientation by considering the following normatively significant aspects. Their order does not reflect a hierarchical ranking, but is derived from the logic of nursing activities.

Well-being: The use of robotics in nursing care can only be justified if it promotes the care recipient's well-being, or at least does not compromise it. In this context, the well-being of the person concerned must be interpreted in a comprehensive (integral) sense: It is not only about the question, to what extent existing functional deficits can be compensated by using technology – e.g. by means of suitable assistive systems enabling a person to carry out everyday tasks independently. Rather, the focus on the well-being of the person concerned also expressly encompasses options to regain, maintain and improve the quality of life by means of rehabilitation measures, and

the overall feeling of personal well-being. Quality of life must be understood here both in the sense of objective living conditions and available lifestyle options, as well as in the sense of individual needs and preferences resulting from subjective perspectives, aims, expectations, standards and wishes.⁶⁷ Focus on the well-being of the person concerned is linked to the expectation that any changes in the situation of care and assistance that may result from the use of robotics are adapted to the concerned person's possibilities of participation. To the extent that such expectations are fulfilled and the risks linked to the use of robotics can be minimised (e.g. through easy usability of the technology), fears with regard to robotics in nursing care can be avoided or reduced. Unpredictable, undesired consequences of technology can be determined in the context of evaluation studies (also after a technology has been implemented) and minimised or completely eliminated. Such evaluation studies should also be seen as an important contribution to stronger user-orientation. Along with personalised medicine, they open up opportunities to establish individual solutions for the use of robotics in the interest of people in need of assistance or care.⁶⁸

Requirements based on constitutional law or human rights aim at guaranteeing a self-determined life with equal rights and full social participation. Being able to live a life where these requirements are mostly fulfilled is an important factor of human well-being. It must be taken into account that the well-being of people in need of care depends to a great extent on their subjective perception or feeling. If it is not possible to receive (or establish) the informed consent of the person concerned, the opinions of various other stakeholders (relatives, nursing staff, attending physicians) should serve as a basis to assess as reliably as possible the subjective well-being according to the person's presumed wishes.

67 Cf. Schenk et al. 2013; Kruse/Schmitt 2014.

68 Cf. Hülsken-Giesler/Remmers 2016, 148.

Autonomy and self-determination: Self-determination⁶⁹ refers to a person's ability to base their thinking and their actions on their own beliefs, wishes and preferences, and/or to the freedom to independently pursue targets and plans they have set themselves. This includes the right to be informed about the technological equipment of a facility before registering, in an appropriate way and with individual support, if required, so that the person can understand the technology and the impact that its use has on them. In the context of using robotic applications in nursing care, this means that the expected benefit must be explained in relation to the individual case, in order to focus on the well-being of the person concerned, as described above. It also means that alternatives (if applicable) to the use of technology and the possible consequences of a refusal to use it must be illustrated. The use of robotics in the context of the facility's processes must then be agreed with the person concerned, if possible. Another important aspect in strengthening self-determination can result from the claim – based on the provisions of social law – that a person should be enabled through assistive technology to lead a self-determined life and depend as little as possible on the support of other people.

Especially with people who due to a neurodegenerative disease cannot decide or act independently, or only to a very limited extent, it can be a great challenge to promote self-determination in terms of focussing on the well-being of the person concerned. Moreover, various components of self-determination can be distinguished in relation to assistive technologies used for persons suffering from dementia: (a) independence in the sense of having the opportunity to act independently of contingent limitations (of which the person has no control) and of external organisation of everyday routines and

69 Since, in contrast to ordinary language, the terms autonomy and self-determination are not consistently used as synonyms in ethical debate, but have different connotations, the German Ethics Council will exclusively use the term self-determination in the present Opinion (cf. Deutscher Ethikrat 2018, 36–40 for details).

life world; (b) ageing in familiar surroundings in the sense of having the opportunity “to live in one’s own home and community safely, independently and comfortably, regardless of age, income or level of capacity”⁷⁰, and (c) user-centeredness in the sense of a technological design that refers to the needs of the person requiring support and that must continuously be adapted and optimised on this basis.

However, independent of the medical particularities of individual groups of persons in need of care or assistance, it must be assumed that the use of robotic systems can have very different effects, depending on their functionality and the conditions for implementation. The use of assistive or monitoring systems can reduce the self-determination of people in need of care or assistance, if they experience the effects and functionality of these systems as either incomprehensible or uncontrollable. To avoid such negative effects, it is necessary to communicate the purpose and use of the respective technical devices, to provide easy handling and to continually verify whether the person in need of assistance or care feels at ease with the use of these technologies.

Identity and relationality: The term identity addresses two closely related aspects in the life situation of people in need of care or assistance. First of all, identity addresses the question of the *self-concept*, it refers to the understanding that a person has of themselves, their biography and their (possible) future.⁷¹ The self-concept not only reflects *how* or *as what* a person considers him- or herself, but also includes the questions of *why*, i.e. the question on the causes of change, which gets increasingly important as a person grows older. A second aspect of identity, which is particularly important in the context of robotics in nursing, relates to the question of how people in need of care are perceived by other people, i.e. how their outward appearance, visible limitations and deficits or the acceptance of help

70 World Health Organization 2015, 225.

71 Cf. McLean 2017.

leads other people to the conclusion that certain features are present or missing. In this context it needs to be emphasised that the self-concept is not independent of relationships and the perception of others.⁷² Identity and relationality therefore correlate, and both are important for the ethical contemplation of the use of robot technologies in contexts of care.

With regard to the *identity* of the person in need of assistance or care, the use of robotic aids can make a positive contribution by compensating through technical means physical or mental deficits that a person has suffered, thus strengthening not only the feeling of *self-efficacy*, but also the *experience of continuity*.⁷³ To the extent that the relation to other people and things that are crucial for one's own identity can be preserved, health-related problems can be alleviated and biographical ties maintained. However, the use of robotics can also have a negative impact on identity, for example if it is associated with experiencing humiliation and disrespect.⁷⁴ This would be the case, for instance, if people relying on assistance or care were to be moved or handled by a robot without their consent, or treated impersonally by it, and thus had the impression of being treated like an object. It also needs to be considered that the use of assistive robotics can affect the self-concept, e.g. if the regular use of assistance accentuates the perception of one's own shortcomings and deficits, or if it is linked to changes in the appearance of a person which might foster a negative perception and assessment by others (e.g. dirty clothing after using assistive robotics to eat without the help of other people).⁷⁵

With regard to *relationality*, the challenge in nursing particularly consists of preventing the loss of personally important contacts (and therefore growing solitude) and of guaranteeing full and equitable social participation. It has been shown

72 Cf. Randall 2016.

73 Cf. Nylander/Ljungblad/Villareal 2012.

74 Cf. Sharkey 2014.

75 Cf. Nylander/Ljungblad/Villareal 2012, 800.

in numerous studies that the risk of social isolation increases significantly due to limitations occurring mainly in old age⁷⁶, and that the loss of social contacts goes along with a (further) deterioration of health and well-being.⁷⁷ The various fields of application of robotics in the care sector (assistance, monitoring, company) therefore entail both potential and risks.

By promoting independence, assistive robotics can support people in need of assistance or care to maintain and cultivate social contacts.⁷⁸ In a worst-case scenario, however, it can also accentuate existing deficits in the social sphere, e.g. if the possibility to eat, get up or get dressed independently with the help of robotics leads to a situation where helpers see the person less frequently, or where nursing staff, instead of having more time for individual care, now must take on additional tasks in another place.⁷⁹

Just like assistive robots, monitoring systems can, on the one hand, lead to increased security or early detection of the need of support and thus enable a person to stay in their private household and familiar social surroundings for a longer period of time. On the other hand, the gain in security achieved through monitoring can contribute to a situation where contact persons feel less responsible or think that fewer visits are necessary.

The same ambivalence is true for companion robots: Robots are most frequently offered as “playmates” or “companions” in the care for people suffering from dementia.⁸⁰ This is done with the intention to have a positive influence on emotional experience – especially by evoking feelings of belonging and affection, which can be the case, for example, if visual or auditory stimulation motivates the person suffering from dementia to react by touching or caressing or to increasingly

76 Cf. Nicholson 2012, 142–145.

77 Cf. Leigh-Hunt et al. 2017, 160.

78 Cf. Ammicht Quinn et al. 2015, 19.

79 Cf. Fachinger/Mähs 2019.

80 Cf. Góngora Alonso et al. 2019.

open up towards other people.⁸¹ The use of such “emotional robots” therefore represents the great potential of assistive technologies to reduce feelings of loneliness, promote communication behaviour and establish or maintain contacts.⁸²

A number of positive effects on the behaviour and the cognitive capacities of patients suffering from dementia have been reported in various studies with assistive robots.⁸³ Studies that consider different kinds of robots, like robots resembling animals, also provide insights into the interaction with anthropomorphic robots, subject to the condition that anthropomorphism is regarded as a tendency to interpret non-human behaviour as something that is triggered by feelings and psychological conditions that are unique to humans (see also section 1).⁸⁴ In this context, the question arises whether interacting with robots which exhibit clearly anthropomorphic features might have (potentially undesired) psychological consequences for the persons involved. In this regard, one can think of (quasi-)personal ways of communication, whereby robots are addressed with a human personal name, treated outwardly with civilised politeness, its reactions intuitively regarded as analogue to that of human beings and the robot itself perceived more like a partner than like a machine. It has meanwhile been shown in a number of studies that personalised modes of behaviour of this kind regularly bring about a corresponding internal change in attitude of the persons concerned, even if they are and remain basically aware of the machine status of their robot counterpart.⁸⁵

Such a change in attitude might have positive or negative consequences for the purposes of human-machine-interaction. In the context of the care relationship, the positive effects probably outweigh the negative ones. The feeling that

81 Cf. Liang et al. 2017.

82 Cf. Baisch et al. 2018.

83 Cf. Wu et al. 2016; Wang et al. 2017; Begum et al. 2013.

84 Cf. Airenti 2015, 119.

85 Cf. Darling 2017 with further evidence.

the “friendly” robot of everyday contact is a kind of partner in the context of one’s own life’s necessities can be motivating for carrying out these tasks. It might also help care recipients to open up for communication with other people, to practise the range of their emotional possibilities and keep them alive, to strengthen their feeling of safety because they are aware of receiving a reliable coaching of their needs, and to have further beneficial psychological effects.⁸⁶ Nevertheless, it may also entail psychological risks. If the quasi-human contact induces the care recipient to project (too) intense emotions onto the robot, a technical failure, a dysfunctional mistake of the machine, and especially the necessity to exchange it might lead to disappointments or, at worst, to a depressive episode. Some necessary procedures requiring a factual-rational way of dealing with robots might also be made more difficult instead of easier if care recipients intuitively qualify them as empathic partners.⁸⁷

On the basis of current evidence, it is not possible to deduce a general rule for the question whether and to what extent an anthropomorphising contact with robots in contexts of care is recommended or contraindicated. The effect of such contact not only depends on the practical contexts for which it may be considered, but also and especially on the individual particularities of the persons involved. What is required on the part of the caregivers is an empathic and sensitive observation of the development that close, long-term forms of human-machine-interaction may take. It also must be made sure that robotics is not used to deceive or manipulate the care recipient.

In order to understand these interactions in detail, research is required with regard to the technological development of robots, the artificial intelligence implemented and the related findings from psychology and social science, as well as the psychological aspects of the interaction between

86 Cf. *ibid.*, especially 175–177, with further evidence.

87 Also *ibid.*, especially 174 f., 178–180.

anthropomorphic robots on the one hand and carers and care recipients on the other hand. For example, there are indications that the degree of distinctness of characteristic human features or the kind of movement play a role in this interaction.⁸⁸ Finally, there are various concepts with regard to the biological, psychological and evolutionary background of anthropomorphism which lead to different conclusions and evaluations regarding the interaction between humans and anthropomorphic robots.⁸⁹

Privacy, intimacy and modesty: The aspect of privacy and intimacy is closely connected to the issue of self-determination.⁹⁰ Privacy refers to the ability (and the claim) of individuals and groups to decide about the contact with and closeness to other people, and about the availability of information on themselves as a person. The need for intimacy refers to a specific aspect of privacy, i.e. the fact that most people do not want to be observed or touched in certain situations. For most people, being observed or touched in situations of great intimacy feels disrespectful of their sense of modesty. In the context of care, possibilities to respect privacy are often limited by restrictions of a person's independence. It may no longer be possible for the person him- or herself to carry out tasks of personal hygiene or go to the toilet without help. According to empirical studies, the presence and attendance of a caregiver might frequently have such a great significance for people in need of care or assistance, that the contact is experienced as positive and is expressly desired, even in usually rather shame-ridden nursing activities like body hygiene, for example. However, the opposite might be true for other people in a similar situation.⁹¹ They feel deeply disturbed in their need for privacy by the presence of and dependence on other people in these intimate situations, which is why they would experience technical

88 Cf. Levillian/Zibetti 2017, 8 ff.

89 For an overview, see Damiano/Dumouchel 2018, for example.

90 Cf. Sharkey/Sharkey 2012b.

91 Cf. Parks 2010, 100 ff.

support as a relief. So even if assistive robotics can, on the one hand, contribute to the protection or re-establishment of privacy,⁹² it must be remembered that the use of such technical products (which cannot be controlled by the person concerned, or only to a limited extent) might, on the other hand, violate the privacy or intimacy of a person.⁹³ This is the case if the effective use of assistive robotics requires the additional usage of monitoring devices, which is frequently the case. Even if people in need of assistance or care have given their consent to such monitoring, they are not always sure where and when their activities and sensitivities are recorded.

4.2 Meso-level of responsibility

At the meso-level, ethical requirements apply that must continually be kept in mind in the development process of robotic systems for the care sector and in institutional decision-making on their use.

Generally, the development of robotic applications for the care sector should not be guided by what is technically feasible, but by actual needs. Development must go along with adequate approval processes to avoid that care recipients and carers are used as an uncontrolled test bed for technological innovations. Apart from questions of safety and efficiency, a simple, intuitive and adaptive usability for various user groups must be defined as a goal in the development process. This brings up the concept of “universal design” which is included in the United Nations Convention on the Rights of Persons with Disabilities (Article 2). Just like any other technological systems, robotic applications in the care sector must be designed in a way that they can be used by as many people as possible without further adaptation or specialisation. People in need of care or

92 Cf. Ammicht Quinn et al. 2015, 18.

93 Cf. Sharkey/Sharkey 2012a, 270 f.

assistance should be able to experience their own competence when handling robots, because they can operate the latter thanks to their existing abilities and they get motivated to use their remaining abilities. Moreover, the robots' design should not accentuate the current need for support by evoking deficit-oriented perceptions of old-age in reference and contact persons, and therefore making it more difficult to maintain and cultivate relationships. In this context, gender issues play an important role. Gender typical experience and needs or even gender stereotypes can influence both the perception of nursing issues and the search for solutions to technically manage these issues.⁹⁴ While robot technology is being developed in IT sciences, which are dominated by male experts, it is being used in sectors where women are the protagonists, both as caregivers and as care recipients. This fact must be taken into account when implementing such technologies.⁹⁵

Since specific decisions with regard to design can have different consequences for various people – either directly or indirectly concerned –, it appears reasonable to already take into account the diversity of user groups and their various needs in the process of technology development. Approaches that have been introduced since the 1990s under the catch-phrases “value-sensitive design”⁹⁶ or “values in design”⁹⁷ are particularly relevant in this context. They highlight the early consideration of social values and ethical principles as well as the integration of directly or indirectly affected people, not only in the process of developing robotic applications, but also in their implementation and evaluation.⁹⁸ These approaches can be transferred to the area of nursing care robotics.⁹⁹ Currently, they are being further developed as part of the discourse on

94 Cf. Kuchenbrandt et al. 2014.

95 Ammicht Quinn (2019) comes up with similar deliberations on the development of artificial intelligence.

96 Cf. Friedman 1997; Friedman/Kahn/Borning 2006.

97 Cf. Nissenbaum 2005; Flanagan/Howe/Nissenbaum 2008.

98 Cf. Simon 2016a; 2016b.

99 Cf. van Wynsberghe 2016.

artificial intelligence in connection with the call for “ethics in design” or “ethics by design”.¹⁰⁰

The demand for need-oriented development also includes the requirement that the development of robotics for nursing care may not focus exclusively on the compensation of narrowly-defined deficits or on making it easier to carry out isolated actions (for both people in need of assistance or care and nurses). Instrumental support services that need to be carried out at regular intervals, like those related to basic body care or food intake, can only be differentiated in a rather theoretical manner from empathic, relation-oriented activities geared to the current need of a person requiring assistance.¹⁰¹ Even though common nursing activities must be provided again and again on a regular basis, they often cannot be exactly planned and may take unpredictable turns because of the relationship aspect mentioned above. This may indicate general limits of robot support in nursing, since technical construction is based on the ideal of exact reproducibility of identical events, which in turn implies that the assigned tasks can be carried out independently of their context, and that situational specificities are taken to an abstract level.¹⁰² This would be an argument in favour of the view that robotics can support care activities in various ways, but cannot relieve nursing staff from the necessity to adapt care processes to changing situations and needs.¹⁰³ This might partly change with the further development of artificial intelligence, but it would not discharge carers or institutions from their responsibilities. It is yet unclear to what extent a care situation design that is based on machine learning and therefore incomprehensible for humans will be accepted by the persons concerned, or seen as a restriction of their rights to freedom and self-determination. This does not only affect

100 Cf. Dignum et al. 2018; Bundesministerium für Bildung und Forschung 2018b, 38–41.

101 Cf. Metzler/Lundy/Pope 2015.

102 Cf. Remmers 2019.

103 Cf. GKV-Spitzenverband 2019, 225.

care recipients. Empirical studies point towards a wide-spread scepticism among nursing staff against an increasing technologisation of their professional activities. There is a marked fear that technical systems functioning in context-invariant ways may go against the individualisation and contextualisation of care activities that are indispensable for good care.¹⁰⁴

The GKV-Spitzenverband (National Association of Statutory Health Insurance Funds) highlights in a study that caregivers will only be capable of co-designing in an appropriate manner the “socio-technological structural change” that goes along with assistive systems, if the corresponding competencies are taught in the relevant training and degree courses.¹⁰⁵ In addition, care facilities and their management are responsible for the further training and continuous education of nursing staff with regard to handling robot technologies. Moreover, they have a shared responsibility for the availability of technical innovations and their integration into an overall care arrangement which is geared to the individual needs and preferences of the care recipients. In nursing studies it is expressly emphasised that the use of robotics may not be justified on the basis of financial or organisational deliberations alone (e.g. possibility to reduce staff or to modify job profiles). Instead, it would be necessary in each individual case to continuously review and evaluate the decision that has been taken in favour of or against the use of robotics, always keeping in mind the needs and preferences of the person in need of care.¹⁰⁶

4.3 Macro-level of responsibility

At the macro-level it is first and foremost necessary to address issues of fair and equal access to innovative technology,

104 Cf. Remmers 2018, 168.

105 Cf. GKV-Spitzenverband 2019, 225.

106 Cf. Hülksen-Giesler/Daxberger 2018.

of its integration into the benefits catalogues of nursing care and health insurance funds, of the various technologies' safety and of data protection. The use of robotics has the potential to promote the independence, quality of life and opportunities of participation for elderly people.¹⁰⁷ Assistive robots can support the self-determined execution of everyday activities, they can reduce dependencies and enable or reinforce experiences of self-efficacy and identity. For this reason, it is important that people who can benefit considerably from the use of robotics have equal opportunities to draw from such resources. This leads to the question of their availability in various institutions and of the financial feasibility, as well as to the issue of information (on existing opportunities) and counselling (regarding the meaning for one's individual life situation). If the provision of good care in in-patient care facilities is closely linked to the availability of robotics (again, it is important to gather more evidence in view of the consequences of the use of technology), then it is essential to address the question of a guarantee for the respective provision in social security legislation. This is certainly the case if specialised scientific evidence suggests that certain forms of robot-based assistance are a basic standard of good care. In this way, the development of technical products automatically leads to an expansion of the benefits catalogue of health and nursing care insurances. As a consequence of such a development, facilities may be obliged to offer the relevant options.

Such a process is outlined in the legislation on social long-term care insurance: Pursuant to Section 113 (1) sentence 1 SGB XI, the Spitzenverband Bund der Pflegekassen (National Association of Long-Term Care Funds), the Bundesarbeitsgemeinschaft der überörtlichen Träger der Sozialhilfe (Federal Association of Supraregional Social Welfare Agencies), the local associations at the federal level and the associations of the nursing care facilities' funding organisations, with the

107 Cf. Alves-Oliveira et al. 2015, 11.

participation of the Medizinischer Dienst des Spitzenverbandes Bund der Krankenkassen (Medical Advisory Service of Health Insurance), of the Verband der Privaten Krankenversicherung (Association of German Private Healthcare Insurers), of the associations for nursing care professions at a federal level, of the competent organisations for exercising the rights of and for the self-help of people in need of care and persons with disabilities according to Section 118 SGB XI, as well as organisations of independent experts, agree on “benchmarks and basic principles for the quality, quality assurance and quality representation in out-patient and in-patient care, as well as for the development of an in-house quality management in care facilities, which is geared to the long-term assurance and further development of nursing care quality.” In a next step, the contracting partners pursuant to Section 113 then “guarantee the development and updating of scientifically-based and professionally harmonised expert standards to assure and further develop quality in nursing care” as laid down in Section 113a (1) sentence 1 SGB XI. Pursuant to Section 113a (3) sentence 2 SGB XI, such expert standards are “directly binding for all long-term care insurance funds and their associations, as well as for registered care facilities”.

Beyond such a technology-assisted “basic care” – provided it is implemented as described above – the state that is responsible for guaranteeing appropriate care may pool specific services or further centralise certain provisions, in order to safeguard that need-oriented care is given and the specific requirements of particular groups of persons are met. Regulations are necessary to avoid unjustified disadvantages or privileges.¹⁰⁸

The development of technical products also has an impact on health and nursing care insurance funds, because the further development of their benefits catalogues cannot ignore the integration of technical products. Such an integration does not mean that support services, which according to the standards

¹⁰⁸ With regard to hospital care in this sense cf. Deutscher Ethikrat 2016, 55.

of good care can only be provided through the personal effort of nursing staff (and are linked to other elementary needs of the person concerned), should be removed or made difficult to access. Research in care emphasises that technology-assisted and personally performed support services are not an alternative or exclude each other. Rather, they should be integrated and complement each other. It is highlighted that, given the limited material resources, funding the use of technology may not compromise improvements to care work carried out by nursing staff, i.e. adequate remuneration, an increase in the staffing ratio and thus a reduction of work density.¹⁰⁹

The use of robotics in care strongly depends on collecting, processing and saving personal data, especially if it is meant to respect the individuality of care recipients. Effective assistance geared to individual needs and specific situations usually requires monitoring: it must be possible to consistently supervise technical applications in their use as well as their potential undesired effects, which means that the corresponding data generally must be made accessible to a larger number of people. As a consequence, the use of robotics in care also raises questions with regard to the protection of privacy and the confidentiality and safety of data that go considerably beyond traditional contexts of nursing care provision. Particular attention must be given to the fact that the persons concerned are often not capable of giving their informed consent to the collection and utilisation of their personal data.

Government support for new robotic applications in the care sector should therefore not only focus on technical aspects, but pursue a holistic approach. This strategy should explicitly take into account the psychosocial and ethical aspects in the development and implementation of technology that are highlighted by the humanities.

Since robot technology in contexts of care, in contrast to industrial robots, for example, is employed in an “unstructured

109 Cf. Hülsken-Giesler/Remmers 2016, 145.

environment” and in direct contact with people, it has to meet exceptionally high safety standards. New kinds of liability issues arise especially with regard to adaptive robots capable of learning and decision-making.¹¹⁰ The claim made by the Data Ethics Commission of the Federal Government with regard to “algorithmic systems” in general, i.e. that the current provisions of liability law should undergo in-depth checks and be revised where necessary,¹¹¹ strongly applies to robots in care, too.

110 Cf. Lohmann 2017, 162.

111 Cf. Datenethikkommission der Bundesregierung 2019, 224.

5 RECOMMENDATIONS

The German Ethics Council contributes to the open public debate on the issue of robotics in care with the following recommendations. They refer to the implementation of robotics, its integration into a comprehensive understanding of good care, the promotion of the care recipients' participation as well as the tasks of care facilities and the training of nursing staff. It is the purpose of these recommendations to promote a use of robotics in care that benefits both care recipients and caregivers and respects the dignity of every person involved:

Development and implementation of robotics

- » Ethical considerations should play a role already in the early stages of development of new technologies. The perspective of people in need of care or assistance and of nursing staff and possible further persons concerned should be taken into account in the development of robotic systems. This is why a participatory approach is recommended even in the development phase.
- » The production and the use of robotic systems in the environment of people in need of care or assistance must meet high safety standards. Compliance with these standards should be guaranteed by preventive measures (like strict regulations for production, approval and use) and reliable compensation of victims, should yet a damage occur (e.g. absolute liability without the possibility to a disclaimer of liability, regulations with regard to onus of proof, insurance benefits). The legislator should review existing legislation (e.g. the *Medizinproduktegesetz* [Medical Devices Act] and liability law) and revise it if it falls short of these requirements.
- » Safety requirements and protection measures (like an emergency shutdown) to avoid dangers for the users of robotic systems must be adapted to the development of robot

technology, considered in the product design and their compliance verified in operation.

- » An erosion of responsibility should be avoided in the development, approval and use of robot technologies by establishing transparent responsibility structures.
- » It should always be clear which institutions or persons are responsible for the proper use of support robots.
- » Before robotic applications can be used as a standard in regular care, there must be sufficient evidence that they actually improve the quality of care.

Integration of robotics into a comprehensive understanding of good care

- » The use of robotics in care must be geared to the aims of good care and assistance. The individuality of the care recipient must be respected and serve as a basis for the planning and provision of support. In this context, the criteria of personal well-being must be taken into account, especially with regard to self-determination, identity, relationality, privacy, intimacy and modesty.
- » The contracting parties of social long-term care insurance are asked to pay particular attention to the area of robot-based assistance in their obligation to develop further the quality of care.
- » Financing and using robotics must not result in cutting the required funds in other areas of care, or in refraining from making appropriate efforts to improve the situation in professions that provide assistance and care.
- » Care guidelines should contain statements detailing which segments of care activities can be completely or partially substituted by technology, and which areas of care should be free from the use of robot technologies because they might jeopardise interpersonal encounters or make them more difficult.
- » Robotics should not simply be perceived on the basis of its effects on particular aspects of care, but of its meaning for

the provision of care as a whole. Nursing care is essentially defined as interpersonal interaction, which cannot be substituted by technology. It is important to make sure that the use of robotics does not reduce or hamper social contacts or compromise experiences of affection and empathy that might be closely linked to the support provided by carers in individual cases.

- » Promoting robotics in nursing care should not only focus on the development of new technologies, but especially on their integration and use in care contexts. This should also include an evaluation of its effects on the quality of care, quality of life and possibilities of participation for people in need of care or assistance.

Promoting the participation of care-dependent people

- » Robotic assistive, monitoring and companion systems should be evaluated by caregivers, their employing organisations and long-term care insurance funds not only according to their objective potential benefits for care processes. Rather, the subjective benefit for the person in need of care or assistance and their individual acceptance must be taken into account.
- » People who are currently relying on care or assistance should get help in clarifying their personal preferences for particular types of care, including the possibilities and limits of robotic applications. Correspondingly, in each individual case it must be considered jointly with the persons concerned what changes would result from the use of robotics for the life situation in either the care facility environment or private home surroundings, and to what extent new opportunities for realising individual preferences and demands should be offered, if applicable.
- » In the context of a proactive and concomitant care planning, the care concept should be explained and the possible integration of robot technologies addressed. Corresponding

information material and consulting services should be provided.

Responsibility of care facilities

- » Even at the stage of construction planning, but also in their mission statements, care facilities should take into account the possible use of robot technologies and the dynamics of their development.
- » When taking decisions on the integration of robot technology in care processes, the management of care facilities should pay appropriate attention to the practical experience made by nursing staff.
- » Facilities that have implemented robotic systems in their care offer are not only obliged to assure regular maintenance, checks and updates of the robots in order to minimise the danger of possible malfunctions and ensuing threats for persons in need of care as well as their own staff. They should also assure that there is a continued care indication for the use of the respective robotic technology.

Training of nursing staff

- » The curricula for care professions should be complemented with courses on new technologies in care, including their ethical implications.
- » In view of the dynamic development in the field of robot technologies, nursing staff should be given the opportunity in the context of further training and continuing education to attain the relevant knowledge in order to consider the potential of technology for the development of nursing care, and to acquire the necessary competences to use the robotic systems that are relevant for their area of work.

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