

# Person Centered Care and Personalized Medicine: Irreconcilable Opposites or Potential Companions?

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Published online: 21 September 2017

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**Abstract** In contrast to standardized guidelines, personalized medicine and person centered care are two notions that have recently developed and are aspiring for more individualized health care for each single patient. While having a similar drive toward individualized care, their sources are markedly different. While personalized medicine stems from a biomedical framework, person centered care originates from a caring perspective, and a wish for a more holistic view of patients. It is unclear to what extent these two concepts can be combined or if they conflict at fundamental or pragmatic levels. This paper reviews existing literature in both medicine and related philosophy to analyze closer the meaning of the two notions, and to explore the extent to which they overlap or oppose each other, in theory or in practice, in particular regarding ethical assumptions and their respective practical implications.

**Keywords** Personalized medicine · Person centered care · Healthcare ethics · Concept analysis

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## Introduction

Personalized medicine (PM) and person centered care (PCC) are two notions that in recent decades have developed in parallel to express ambitions to individualize the design of care and align it better to fit the situation of single patients. This is in contrast to standardized guidelines and treatment prescriptions based on statistical average results from broad population studies with wide deviations from the mean. At the same time, the respective sources of the two notions are markedly different. While the personalization comes out of a biomedical framework, primarily guiding preclinical drug-development, e.g. on pharmacogenomic grounds, person-centeredness originates from a caring perspective, and a drive for a more *holistic* view of patients, where perspectives usually ignored in the biomedical framework are highlighted.

Recently, however, PCC and PM have started to drift more into the attention space of each other, as their advocates have begun to take over each other's terminology and central themes. From the PM side, there are increasing traces of ideas hinting at a need for PCC as part of their aspirations. A few articles include focus on the person as part of the definition of PM, and highlight the idea that PM needs to involve partnership between the healthcare providers and patients [2], or taking into account the patient's personal preferences, needs, and personality [2, 16, 46]. From the PCC side, similar conceptual appropriation is visible. A recent Cochrane report by leading PCC advocates referred to typical PCC approaches as being about "personalized care planning" [4], and other contributions have introduced personalization as a given part of the PCC package, e.g. talking about "individualized care [...] personalized to one person" [27], and similar positionings [43].

The fact that PM and PCC aim for something that on the surface seems very similar, i.e. individual flexibility and variability in treatment decisions, but stem from very different background perspectives and values, transforms these new tendencies into a potential problem. Can the underlying tensions between these perspectives and values allow the notions of PM and PCC to be combined in theory and/or practice, or do these tensions imply outright incompatibility at fundamental and/or pragmatic levels? This paper approaches this issue based on existing research literature in both medicine and related philosophy. The aim is to analyze closer the central meaning of the two notions, as they are in fact being used in these contexts, and to explore the extent to which they overlap or oppose each other, in theory and in practice, in particular regarding ethical assumptions and their respective practical implications.<sup>1</sup>

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<sup>1</sup> Both of these practices also actualize a number of ethical issues [32, 39]. The present paper, while noting ethically relevant conceptual similarities and differences between the two notions, is not meant to engage substantially with any of these.

## Methods

In order to make sure that our analysis targeted practically relevant ideas, we wanted to ground it in actual uses of PM and PCC by scholars in the respective areas. In addition to looking at works we already happened to know about, we also made a search of a number of research databases for the terms “person centered care” and “personalized medicine” and their variations, linked to ethical and other related themes.<sup>2</sup> Articles were then sorted based on how substantial their PCC/PM definitions were, and of 240 articles, 52 presented some explanation of the relevant terminology and were subsequently analyzed further using philosophical conceptual analytical approaches. It is important to note that the aim of this “mixed method” was only to secure practical relevance of what is mainly a theoretical, analytical exercise. In particular, we have not attempted to achieve a comprehensive or systematic review of the concepts of PCC and PM, nor do we claim to have discovered *all* uses or *the* use of these notions. We have simply consulted a broad sample of the research literature to make sure that what we have analyzed philosophically are concepts in actual use among researchers.

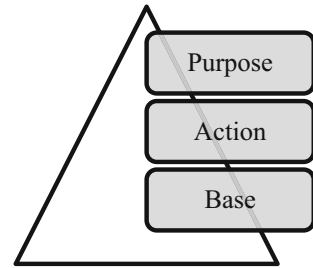
This subsequent analysis presented some challenges, as PCC and PM are vague concepts [5, 9, 18, 23, 40, 41], creating difficulties to determine which ideas in the literature are truly central to either concept and which merely relate to some practical implementation thought (rightly or wrongly) to exemplify PCC or PM. At the same time, a few central themes of the respective notions, sometimes presented separately from one another or expressed differently by different authors, appeared in the material. Among the ideas extracted from the PCC literature, for instance, were the following three: recognizing and meeting the person’s complex needs [10, 23, 25, 27, 34, 41, 43, 45], valuing the person [25, 26, 29–31, 41], and treating persons as individuals [10, 25, 28, 34, 36, 41]. We took such underlying themes to express the core meaning, tightly linked to ethical stances, of the respective notions. In the example just given, an idea within the PCC movement is about the (value of) recognition of the uniqueness and complexity of persons. Such underlying themes were then used as analytical tools to clarify the respective more precise core meanings and ideas of both notions.

In order to reveal these conceptual cores, we grouped the recurrent themes presented in the articles into three interconnected levels that form a model for each concept, unifying them structurally, but allowing for wide differences at the same time: (1) at the *base* of the model, a core assumption or requirement on which the concept rests; (2) at the center, an intervention level in which the professional-patient interaction takes place, referred to as the *action*; and (3) at the top, an aim which the intervention strives to achieve, referred to as the *purpose*. Please refer to Fig. 1.

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<sup>2</sup> The databases consulted were CINAHL, Google Scholar, Philosopher’s Index, PubMed, and Web of Science.

**Fig. 1** Three interconnected levels forming a model for each PCC and PM



## Analysis of the Models of PM and PCC

### Personalized Medicine Model

Personalized medicine<sup>3</sup> involves customizing or tailoring prevention strategies and/or interventions or treatments based on patients' genetic information or other biomarkers, against the background assumption that genetic and other basic biological differences between patients may affect treatment outcome [1–3, 9, 14, 15, 21, 22, 33, 35, 39, 40, 44, 46]. PM aims to optimize medical results and patient outcomes such as reducing medical expenses, making medical decisions easier, increasing drug efficacy, and improving drug safety through reduction of adverse drug reactions [1, 2, 9, 35, 46].

Thus, the assumption about the relevance of the patient's genetic (or other biological) makeup for treatment outcomes is at the *base* of the PM model. Extracting information about this makeup through testing [12, 14, 16, 22, 39] and tailoring interventions based on that, forms the *action* level. These actions, moreover, are undertaken with the *purpose* of better control of the medical outcomes. Some examples of how this core meaning and values of PM are expressed follow here:

The core definition of personalized medicine is using an individual's specific biological characteristics to tailor therapies to that person, including drugs, drug dosage and other remedies [44].

In general terms, personalized medicine is an attempt to synthesize an individual's clinical history, family history, genetic make-up, and environmental risk factors to individualize the prevention or treatment of disease...medical providers hope to soon use an individual's genetic information to identify risk factors, initiate preventive measures, and—if disease has already occurred—personalize treatment plans [3].

<sup>3</sup> In recent years, following the formulation of certain funding programs, this term has somewhat shifted to *precision medicine* instead of personalized medicine. This shift emphasizes the PM push towards a more "objective" view of the patient, which will be described in "Agency, holism, and reductionism: the subjective-objective tension" section of the paper.

One major aim of personalizing medicine is to increase safety by reducing adverse drug reactions (ADRs) and to distinguish between those who will benefit from a medicine and who will not [1].

The overarching goal of personalized medicine is to optimize medical care and outcomes for each individual, to include treatments, medication types and dosages, and/or prevention strategies may differ from person to person—resulting in an unprecedented customization of patient care [14].

## Person Centered Care Model

The *base* of PCC is about the complexity of the patient (including interpersonal connections and dependencies) and the variability between people, recognizing the person or the individual behind “the patient” [8, 10, 25, 26, 28, 34, 36, 41], valuing this person [25, 26, 30, 31, 41], and respecting her dignity [36] and rights [28, 30]. The interaction between the healthcare professional and the person receiving the care happening at the *action* level consists of getting to know the patient through her personal narrative [10, 18, 24, 26, 28, 30–32, 36, 37, 42, 43], and collaborating through shared decision making [24, 30, 36] within the framework of a continuous partnership in care [6, 7, 27, 32, 34, 45].

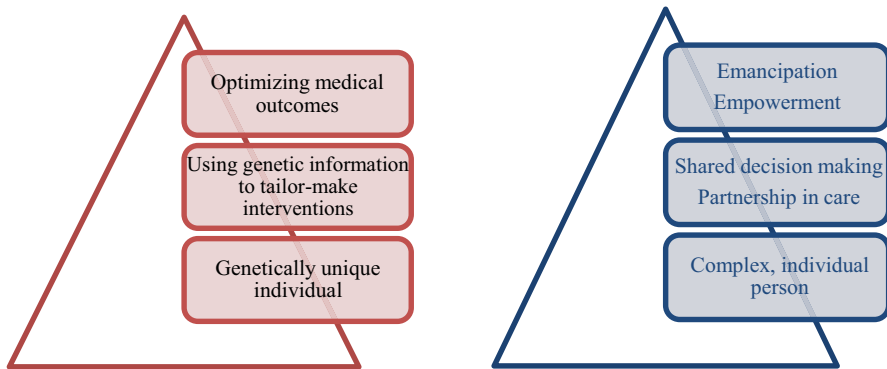
The *purpose* level of PCC is more complex and potentially incoherent. While it is crucial to avoid reducing the point of PCC to measurable outcomes [31] such as patient satisfaction, higher adherence, or fulfilling patient preferences [8]; improved patient adherence to medical plans is at the same time often cited as a reason for implementing PCC [7, 32]. There is nevertheless a widespread consensus in the PCC literature that if adherence is not a result of actions meant to empower and emancipate patients, it cannot be PCC. Thus, the general *purpose* of PCC is about empowering and emancipating the person, with an opening for having the realization of this purpose valued in different ways depending on whether it is desired for its own sake or for something further [24, 30, 36]. Here are some examples of how this idea of what PCC is about is expressed:

Person-centered care is holistic, flexible, creative, personal and unique. Person-centered care is not reductionist, standardized, detached and task-based. Not unless the person wants it to be [6].

The relationship between person and carer is one of individuality and sharing where the carer recognizes pathways of care but designs them for the individual [41].

Person-centered care is an approach to nursing practice that is defined by respect for the person, individual right to self-determination, mutual respect and an understanding of the importance of personhood [30].

To facilitate the overview of this analysis, these core contents of the respective notions are represented graphically in Fig. 2. The content resulting from our analysis of the literature will, in the following sections, be used for attempting to



**Fig. 2** Comparing PM (left) and PCC (right) models with three interrelated levels: base, action, and purpose

answer the central question of this article: To what extent may the notions of PM and PCC be combined, in theory as well as in practice?

### **Individualization: Power, Responsibility, and Threats of Inconsistency**

Something that clearly unites PCC and PM is the ambition to move away from standardization and universal guidelines towards individual tailoring strategies. This ambition holds out both PM and PCC as methodological paradigm shifts, appearing on several levels. In PM, the first level is the signal to move from one-treatment-fits-all approaches “[...] based on the body of clinical data available for a particular question” [15], to treatments specially designed for each individual patient.

This paradigm shift from the traditional ‘one-size-fits-all’ therapy concept to personalized medicine is having an effect on current health-care systems [22].

On the PCC side, the first level is rather about a shift of power [34, 41], which takes place through the reference to ‘persons’ rather than ‘patients’ and the mentioned assumed values linked to that [7, 41]:

[person centered care] reduces the power-laden relationship that may generate from seeing the person as a patient and recognizes the ethical issues of the receiver of health care [41].

The second level, common to both PM and PCC, is a declared shift of responsibility. For the former, there is a shift from the collectives to individuals, as being more knowledgeable about one’s predispositions is thought to imply more responsibility for the outcome of actions taken (or not taken) to manage health problems:

Responsibility for good health is shifted from government and collectives to the individual, such that the individual is now “responsible” for his or her health or disease [39].

For PCC, the responsibility shift is linked less to the outcomes and more to decision making processes, where the emancipation of persons by means of shared decision making and partnership in care is believed to transfer power and control, and a resulting shift of responsibility, to the receiver of care:

The transfer of the decision-making authority towards the patient is accompanied by a transfer of responsibility [32].

The relationship between these assumed responsibility shifts is complex. While the knowledge offered by PM provides a ground for more responsibility through increased detailed knowledge of how treatments may affect outcomes, it could also be argued that the same knowledge relieves responsibility because of the lack of ability to control the complexity of predispositions that this information (often) reveals. At the same time, one may argue that such lack of control is objectively in place regardless of whether or not the patient knows about it, although it may be subjectively disempowering to realize how difficult it may be to treat one's condition optimally. Of course, healthcare professionals are here meant to step in and assist the patient to ensure that the desired "tailoring" of treatments is done right. This, however, increases as well as perpetuates a substantial reliance on healthcare professionals which, in itself, may be seen as a source of patient disempowerment from a PCC standpoint.

Going from the general to the specific is a point that both models converge at, but which also raises a joint question of possible incoherence. In clinical practice, there are standardized treatment guidelines for a person with cardiac failure, for example. There are certain blood tests, chest X-ray, echocardiography, etc. required for initial evaluation; medications prescribed to almost all patients with the condition such as ACE inhibitors and beta blockers; and physical assessment and other tests are done in follow-up visits. While PM and PCC use such standardized guidelines as starting points for determining the care delivery to an individual person, they also push away from them to achieve further individualization that moves beyond that offered by such an "empirical" treatment approach. Whether this trend of individualization of care aims to completely replace standardized medical guidelines remains an open question. If so, and if the general inclination moves toward individualizing healthcare for all persons seeking it, this may impact evidence-based practice, development of healthcare standards, and quality assessment and improvement [17, 32, 38].

### **Agency, Holism, and Reductionism: The Subjective–Objective Tension**

The different sources of PM and PCC seem to lead to a tension between their respective ideals. On one hand, PCC originates from a caring perspective and aspires for a more holistic view of patients [6, 23, 29, 34]. PCC purports to be non-reductionist in that it highlights care-oriented health care ethical ideals. It attempts to push away from a restricted biomedical model of patients and their needs [18, 25, 34], and focus on the complex person [23, 26, 34]. PM, on the other hand, stems from the biomedical framework and represents a more traditional efficiency-

oriented health technology assessment ideal, where optimization of biological outcome parameters is the very purpose. By pushing towards a higher success rate, PM becomes more mechanistic and reductionist. Hence, a classic tension arises and affects all three levels of the two models presented in section “Analysis of the models of PM and PCC”.

At the *base* of the models, the tension occurs between PM’s assumption which rests on very specific physical aspects of the patient versus a more comprehensive view including many non-physical aspects in PCC. PM’s *action* involves the development of an individualized plan of care based on the patient’s genetic information, whereas the process in PCC is dependent on both the person and the healthcare provider interacting dynamically, collaborating, and deliberating about the best plan of action based on a broad range of personal information. While PCC focuses on the person’s narrative to achieve partnership in care, the PM patient is seen an individual incidence of a general—albeit complex—statistical pattern to be manipulated for the benefit of an objective care goal, where the patient’s voice is not needed at all. At the top level of *purpose*, PM aspires for more control over the optimization of medical treatment results, more precision, increasing predictability of disease, and control over the outcomes. In contrast, the PCC model builds on the person’s agency and empowerment, and may thus involve increased uncertainty of the outcome and less control for the professionals.

These tensions exist because of the distinct focus of each model. While both of them move away from standardized handling and aspire to have the individual in mind, they regard that individual quite differently: one focusing on objective aspects and the other highlighting the subjective. We will refer to this as the subjective–objective tension between the models, and proceed to describe how it can be understood as more multi-dimensional and complex than it first appears, with the models potentially complementing each other regarding targeted patient groups, potentially including elements of each other, as well as sharing potential weaknesses often held up by the advocates of one against the other.

Despite the focus on the subjective, the idea of the “complex person” in the PCC model is not exclusively subjective. Even when the individuality of the person and the complexity of her life are recognized, her narrative deemed central, shared decision making emphasized, and her emancipation aimed for; the fact remains that the person is embodied and that the physical dimension of her experience must necessarily be taken into account. Therefore, PCC may seem to be wider in scope and perspective than PM. However, there also seem to be PCC elements that are not requisite for PM to work, such as basic decision making capacity, autonomy, and agency of the person which make PM more widely applicable than PCC. Even though one level of the paradigm shift that PM is held out to represent includes a shift of responsibility to the individual—which might hint at a moral agency component on the patient’s side—PM remains, theoretically, a fully functional framework without an autonomous agent on the receiving end (as in the case of comatose patients or infants). This is not to say that PM *cannot* take into account the subjective aspect of patients that do meet the PCC requirements of agency, but it is not necessarily included and thereby makes PM potentially useful also in cases where this agency is not in place.



That contrast seems to open up for an outright animosity between the models: PCC advocates often highlight an aim to avoid reducing patients to their bodies, and a part of the subjective–objective tension between the models described is attributed to PM resting on exactly this kind of reductionism. However, by focusing on the tension itself, we can see how PCC is actually vulnerable to its own kind of reductionism: Too much focus on the subjective in the subjective–objective tension could have implications that go against PCC’s own purpose to emancipate and empower patients. This risk becomes visible when reflecting on the strong element of having professionals adapt to whatever patients may find of importance, although such preferences may often themselves result from the patient being disempowered or incapacitated by circumstances and structural factors.<sup>4</sup> This may apply to cases of non-adherence when the outcome of treatment depends on so-called *lifestyle*. In such cases, a patient’s unwillingness to adjust living conditions may have an uninhibited kind of PCC produce decisions that mainly serve to reinforce the factors underlying the patient’s initial lack of power and capacity [8, 19]. But even when that does not occur, it seems that PCC may be just as reductionist as PM.

Finnsbo [11] describes a case with Lisa, a woman in her 80s diagnosed with congestive heart failure causing blood pooling in her lungs and poor blood circulation, leading to edema in the extremities. Diuretics are prescribed to decrease edema, but this causes a need to urinate very often, sometimes more than once every hour. At the same time, Lisa leads an active social life with dancing as a main hobby, and the side effect impedes this aspect of her life. It is embarrassing for her to leave her dance partner several times or to ask the bus driver to stop for toilet visits to and from dance sessions. But she also finds the multiple toilet visits during the night to drain her of the energy required by her hobby. At the same time, if Lisa does not take the diuretics as prescribed, the edema in her lungs can cause pneumonia, for which she has already been admitted several times to the hospital in the last few years.

In this case, PCC may, of course, result in a compromise regarding a dosage that balances the value of avoiding serious health consequences with the value of practicing one’s hobby, while also taking into account the possible effects on adherence. However, there is no guarantee. The shared decision making may just as well attain a focus akin to the meeting of a momentary consumer demand [32, 38]; thereby having somatic concerns becoming entirely subservient to contingencies of the person’s agency. While some ethical perspectives may be mobilized to defend such an approach, it seems that it is nevertheless based on a view of the patient that is *just as reductionist* as the one forming the base of PM, and is typically rejected in PCC. Thus, when taken to their extreme, the models would seem to share the feature of being unable to acknowledge a holistic view of the patient as a person that consists of both body *and* mind. For such an acknowledgement, both models would seem to need to be combined with- or complemented by- elements of the other.

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<sup>4</sup> It has been noted that this specific feature of PCC may give rise to especially complex ethical priority setting issues about applying inefficient but desired therapies [17, 32, 38].

## Possibility of Companionship

There is, in theory, a version of PM, which may exist independently of any kind of person centeredness. Yet, there is another version in which a more complete idea of persons is bound to be included because of an inevitable overlap of PM with PCC in practice. In spite of its reductionist base, the pragmatics of PM are very likely to attract more clinical attention to the personal agency and conditions of patients. This is because PM needs elements of PCC both to be able to respect central medical practice values (such as having patients give genuine informed consent to genetic tests), and to ensure that the tailoring of treatments will be matched by patient adherence (e.g. regarding drug dosage). So, while PM is theoretically a functional model on its own when treating patients who do not meet the agency requirement of PCC, PM would still need a PCC approach to function *well*.

As illustration, consider the example of Rose, a 56-year-old woman, recently diagnosed with estrogen receptor positive (ER+) breast cancer. Because of the type of cancer she has, her oncologist finds that hormonal therapy for a few years will work best. Before proceeding with the treatment, the oncologist requests a genetic test to see whether Rose has a gene mutation which would make metabolizing tamoxifen, a commonly prescribed medication for ER+ breast cancer, difficult. As it turns out, Rose has that mutation and tamoxifen will not be very effective in treating her cancer. Rose's mother had died from metastatic breast cancer 5 years ago and she was undergoing chemotherapy for a few years before she passed away. Rose witnessed her mother's suffering due to the side effects of chemotherapy and it was quite traumatic. She only went to consult an oncologist after both her children nagged her to show the lump on her breast to a medical professional. After being told that tamoxifen might not be effective in her case, Rose refuses to even discuss other options. The oncologist explains that further genetic testing will help determine the right medication and the right dosage for her so that she experiences optimal treatment and minimal side effects. Rose tells the oncologist she either sticks with tamoxifen, even if it works minimally, or she would rather die.

Even though an optimal treatment might exist in Rose's case, her initial resistance to explore this possibility calls for an approach that is not provided by the PM model. What is needed here is a model that focuses on dialogue and continuous interaction, where Rose's initial strong feelings are taken seriously, as a base for attempting to find a way ahead other than just accepting her refusal and parting ways. Thus, the need for a person centered approach can be demonstrated, for instance, when a disagreement occurs in the PM setting between the healthcare professional and the patient. In Rose's case, getting to know her as a person and understanding her experience with her mother is crucial to the decision making process which follows. Another example may be that biomarkers tested for, as part of a PM procedure, may sometimes produce incidental information of relevance to dimensions of a patient's life other than the choice of treatment (e.g. predispositions and risks that threaten both the psychological and somatic health). The availability of an optimal treatment for an individual patient does not automatically guarantee its delivery, and many elements of the PM strategy (such as genetic tests) may in

other ways complicate the project of optimizing the health output of the clinical decision. Hence, since a person's body cannot be isolated from the rest of her life, PM would benefit from adopting a wider scope in order to achieve its purpose, albeit this purpose is defined in purely somatic terms. It may be that a growing insight of this aspect is what explains the recent increased signals from PM advocates to embrace typical PCC themes, as mentioned at the outset of this article. However, from that perspective, it remains unclear what the inclusion of a clinical care model, that in other respects seem to conflict with central components of the PM model, will imply for the future shape of the latter.

For the question remains whether PM can be of any crucial assistance from the perspective of the PCC model. As such, the latter seems to be able to persist and function on its own terms, regardless of the existence of any PM solutions. PM can certainly be brought up as one of the options offered to particular patients in the course of the shared decision making level of PCC. Some of its core aspects do seem to resonate with those of the PCC model on an abstract level; regarding individualization and the aim for a “paradigm shift”. Also, in some cases PM solutions may, of course, help to mitigate conflicts between the aims of achieving good biomedical outcomes and of preserving important lifestyle aspects or other personal values of the patient—or values underlying PCC itself, such as preserving patient capacities that are of importance for agency—such as through reducing side effects while maintaining therapeutic effect. However, in other cases, PM solutions may just as well be of no help at all from a PCC standpoint. PM solutions might even make the conflicts addressed in a shared decision making setting more drastic; for instance, through introducing challenges regarding the handling of genetic information [13, 20]. At the *base*, however, there does seem to persist an irresolvable conflict between PM and PCC with regard to the basic view of the patient; and as we have seen, that conflict may have extreme variants of the models produce irreconcilable reductionist assumptions about what may be of importance in health care in general, as well as for individual patients.

## Summary and Conclusion

The question of this paper is to what extent apparent ambitions in the literature to view PCC and PM as related approaches to clinical decision making, or to bring them closer together due to similar purposes, are consistent with underlying assumptions and linked values of the respective models. To achieve this, we have analyzed how research presentations of PM and PCC that also focus on the ethics and value aspects describe what these respective approaches are about in terms of *base* assumptions, recommended *actions*, and the *purpose* aimed for. This analytical form provides an opportunity to spot similarities at the same time as substantial differences are given an equal chance to be visualized.

There does seem to exist a common ground between the two models at the *purpose* level in terms of moving away from standardization and one-treatment-fits-all solutions in the direction of increased individualization and flexibility. Both also share an ambition to thereby constitute a radical shift from (perceived) current

standard practices of clinical decision making. At the same time, both PM and PCC share a paradoxical feature of apparently assuming the same sort of standardization to be in place at the *action* level that they are declaring themselves to be pushing away from at the *purpose* level. Moreover, at the combination of the *base* and the *purpose* levels, both are being threatened by reductionism, mostly highlighted from the PCC side against the PM side, but according to our analysis, is as much a possibility in the other direction. This suggests that the models need each other to be able to account for a holistic view of the patient as a person in the sense of a unified “embodied mind”. There is also a common perception within PM and PCC to be shifting responsibility through giving patients more control. However, closer analysis suggests that this relationship is far from straightforward, especially as PM includes a number of elements that would seem to potentially undermine patient responsibility, albeit also possibly serving an opposite purpose.

We have argued that, despite surface similarities noted above, the models aim at *very* different purposes on a theoretical level, linking to stark differences in the focus of their respective *base* assumptions regarding the nature of patients. At the practical level, however, the *action* and *purpose* of PCC seem to provide a general practical potential for helping PM better achieve its aim of optimal biomedical treatment outcomes. It is, however, less easy to see what *general* value the PM action and purpose could have from the PCC standpoint, unless these appear as incidental ways of performing the PCC action and realizing its purpose in a particular case. This may happen, but just as well, PM may have no role in the practice of PCC, or even impede its action and undermine its purpose. For this reason, further analysis of PM that includes the use of PCC must investigate more closely what this implies. In contrast, PCC advocates have reason to ponder whether or not labelling PCC as an example of “personalization” really has any substance beyond the attempted appropriation of a buzzword. In both cases, the conceptual relations we found in this article between PM and PCC warrants attention for further empirical or theoretical analyses and probing ways in which combining these concepts applies to practice. For instance, it may be of interest to take our results here as a starting point for a more empirically oriented full-scale mapping of *all* uses of the PCC and PM concepts, and investigate if there are other uses besides the ones we have analyzed here. It may also be of interest to investigate not research articles, but policy documents such as position statements, guidelines, or research program calls, advocating PM or PCC, to expand the sort of analysis we have made here.

**Acknowledgements** This research was supported by the Swedish Research Council (VR) and the Swedish Research Council for Health, Working Life and Welfare (FORTE), Contract No. 2014–4024, for the project Addressing Ethical Obstacles to Person Centred Care; and VR for the Gothenburg Responsibility Project, Contract No. 2014-40.

### Compliance with Ethical Standards

**Conflict of interest** Christian Munthe is a deputy member of the Swedish National Gene Technology Advisory Board, and a member of the Delegation for Ethics of the Swedish Society of Medicine. Lars Sandman is a member of the following councils (all related to healthcare providers or authorities): The ethics council of the Swedish National Board of Health and Welfare, The Brage Council of the Swedish Agency for Health Technology Assessment and Assessment of Social Services, The New Therapies

Council, The Program and Priorities Council of the Västra Götaland region. He is also a scientific advisor to the Swedish Dental and Pharmaceutical Benefits Agency.

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