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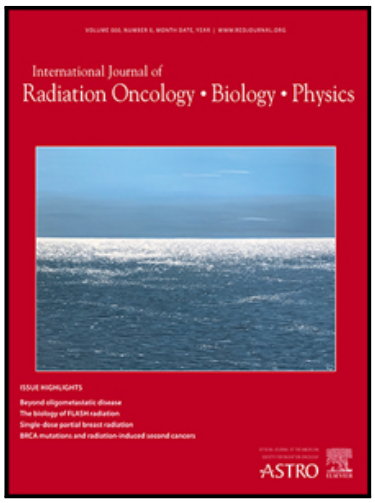

Qualitative study on diversity, equity, and inclusion within radiation oncology in Europe

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Qualitative study on diversity, equity, and inclusion within radiation oncology in Europe

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ABSTRACT

Purpose:

Organizational culture plays a major role in prioritizing Diversity, Equity, and Inclusion (DEI) objectives by aligning individual values of employees with organizational values. However, effective strategies to create an inclusive organizational culture, in which these values are aligned, remain unclear. The European Society for Radiotherapy and Oncology (ESTRO) launched a qualitative study, XXX on DEI that highlighted low levels of inclusion and work engagement among radiation oncology (RO) professionals in Europe. The aim of the current study was to gain an understanding of how DEI could be improved within RO departments by creating a more inclusive organizational culture.

Materials and Methods:

A qualitative research study was conducted by enrolling RO professionals from four selected European countries through an open call at the ESTRO platform. Respondents who filled in an online survey and met the inclusion criteria, such as experiencing low DEI levels at work, were invited for an online semi-structured interview. Interview transcripts were analyzed thematically

with an abductive approach via concepts in relation to "DEI", "work engagement", "organizational culture" and "professional values".

Results:

Twenty-six eligible respondents from Great Britain, Italy, Poland, and Switzerland were interviewed. The thematic analysis identified cases in which limited engagement at work emerged when the personal values of RO professionals conflicted with dominant organizational values, hampering DEI. Three conflicts were found between the following personal vs. organizational values: 1) self-development vs. efficiency, 2) togetherness vs. competition, and 3) people-oriented vs. task-oriented cultures.

Conclusions:

Awareness should be raised on how organizational values can conflict with professionals' values to improve inclusion and engagement in the workplace. Additionally, efforts should be focused on tackling existing power imbalances that hamper effective deliberation on the organizational vs. personal-value conflicts.

Keywords:

Organizational culture, Diversity, Equity, Inclusion, DEI, work engagement, healthcare, radiation oncology, ESTRO, Europe

Running title: DEI within radiation oncology in Europe

MANUSCRIPT

Introduction

Diversity, Equity, and Inclusion (DEI)[1] at work has become increasingly important within healthcare (2). DEI levels are associated with work retention and engagement, thus improving DEI leads to more inclusiveness by employees at their workplace which can lead to better work commitment and wellbeing (3-7). Engaged employees are subsequently more likely to be enthusiastic and dedicated to their work with higher levels of productivity and improved work quality (8-10). Moreover, promoting DEI can lead to higher quality in science and education (11). Recent studies from the United States (U.S.) have shown that addressing and promoting DEI has a positive impact on the work environment, organizational performance, and patient outcomes (12). Racial/ethnic concordance between patients and their physicians leads to higher ratings of patient positive affect and longer clinical visits (13) and promotes compliance with treatment recommendations, thereby improving outcomes (14). Conversely, lower levels of DEI are related to stress and burn-out and can have a negative impact on professional and personal

[1] Following Dillard and others, diversity broadly refers to individual socio-cultural characteristics, such as cultural background, gender, sexual orientation, and religious beliefs; Equity refers to fair treatment, access, equality of opportunity, and advancement for everyone; And. finally, inclusion refers to involvement and empowerment, where all employees' inherent worth and dignity are recognized 1. Dillard-Wright J, Gazaway S. Drafting a Diversity, Equity, and Inclusion Textbook Inventory: Assumptions, Concepts, Conceptual Framework. *Teaching and Learning in Nursing* (2021) 16(3):247-53. doi: https://doi.org/10.1016/j.teln.2021.02.001..

quality of care (3, 4, 15). To ensure the best possible care, it is important to have an inclusive and engaged healthcare workforce that is representative of the communities served.

Still, DEI in healthcare is not fully implemented and disparities continue to persist among underrepresented groups of healthcare workers (5, 16, 17). Among radiation oncology (RO) professionals, gender diversity has remained elusive (18), and it has been reported that women and Black physicians are underrepresented in the U.S. RO workforce (19, 20). In 2020, the Young and the National Societies committees of the European Society for Radiotherapy and Oncology (ESTRO) launched a survey to assess DEI and work engagement in RO in Europe. Low levels of engagement and inclusiveness have been noted, with lower average DEI scores compared with their counterparts in the U.S., and with underrepresented groups scoring lower than well-represented groups (21). The results suggested that actions are needed to improve DEI among RO professionals in Europe. Yet, only a few studies on addressing DEI among RO professionals exist (21) that give limited insight into how to promote equality (22).

Various studies, outside the RO context, showed that organizational culture plays a major role in prioritizing DEI objectives (23-27), and that it has a strong relationship with work engagement (28). The organizational culture defines and creates a unique workplace and can be continuously changed and adapted. Organizational culture change is the process by which an organization inspires employees to adopt behaviors and ways of thinking consistent with the organization's values and goals. Organizations with strong inclusive cultures are able to align individual needs and values with those of the organization (15), consequently helping employees with achieving their goals and reaching their full potential (29). By prioritizing DEI objectives, improving work engagement and inclusiveness, a successful organization can promote professional wellbeing and retention and achieve high-quality care for the patients (30).

As follow-up on the initial survey launched by XXX (21), a qualitative study was conducted to gain a better understanding of situations in which low levels of DEI are experienced in the European RO community and to investigate how DEI could be improved within RO by creating a more inclusive organizational culture. Based on the analysis of interviews with RO professionals, we further characterized the need for DEI, advised on potential interventions, and proposed recommendations on how the organizational culture within a department could help to improve DEI and work engagement.

Materials and Methods

Based on a previous study (21), a follow-up qualitative study was conducted in the period of February to June 2022. This study was a collaboration between qualitative health researchers and RO professionals.

Respondents

Respondents were recruited from four European countries: Great Britain, Italy, Poland, and Switzerland. In selecting the four countries, a diversity in geographical location in Europe and its cultural traditions was taken into consideration to capture the heterogeneity of the community. Based on the cultural dimensions of Hofstede (31), these four countries represent four different regions in Europe, North-West, South-, East-, and Central Europe, respectively. Additionally, the number of respondents who completed the initial survey was considered (21). Despite high number of participants in the initial survey, the Netherlands and France were not chosen. This was decided 1) to keep the neutrality of all interviews as the qualitative researchers were Dutch; 2) Italy was chosen over France, to better represent Southern-European culture. Respondents

were recruited through an open call via email to all ESTRO members, social media (LinkedIn® and Twitter®), and professional networks. Interested respondents were first asked to fill in an online survey, based on the initial survey (12, 21) via the platform Survey Monkey[2]. Respondents who met the inclusion criteria received an open invitation via email to participate in this study. To specifically learn about low DEI situations, RO professionals were eligible if they experienced challenges regarding DEI at work. To capture this, the research team opted for a cutoff of about 20%, i.e., when respondents answered 'disagree' in at least four of the 22 questions of the selection survey (12, 21). In addition, agreeing on publishing the data, and being currently employed in either Great Britain, Italy, Poland, and Switzerland, were used as inclusion criteria. Furthermore, to safeguard the generalizability of the results, we used data triangulation (32) and purposeful sampling (33) through selection of participants from various backgrounds (e.g., nationality, age, gender, seniority level, and professional role).

Interviews

Semi-structured interviews were conducted to obtain insights into how the participating RO professionals experience and perceive DEI at the workplace in relation to their own work engagement and inclusiveness and how the organizational culture plays a role in these processes. An interview guide was developed and discussed with the research team (Supplementary Material 1). The interview guide focused on how respondents experienced work engagement,

[2] www.surveymonkey.com

how this engagement was influenced through their experiences with DEI at work, and how these experiences were related to the organizational culture of the healthcare institution. The questions were based on the conceptualizations of the notions "DEI", "work engagement" and "organizational culture" and questionnaires were developed from these conceptualizations (2, 34-38). To improve the validity, investigator triangulation was used by conducting the interviews by two researchers (XXX and XXX, under supervision of XXX). The interviews were conducted online, via Microsoft® Teams or Zoom®, over approximately 60 minutes. The interviews were recorded and transcribed verbatim.

Data analysis

To find patterns in the interview transcripts, a thematic analysis was conducted (39) by qualitative health researchers (xxx, xxx, xxx). We adopted an abductive approach which allows for a combination of deductive (theory-driven) and inductive (data-driven) analyses (40). Deductive codes were derived from the conceptualizations of the notions "DEI", "work engagement", "organizational culture" and "professional values". The coding scheme can be found in Supplementary Material 2. Text fragments were coded via both Excel® and MAXqda®. Based on the coded segments, themes were derived for conflicting values in relation to DEI at work.

Ethics

The study design was approved by the Research Ethics Review XXX (number: XXX). Written informed consent for participation in the research study was signed by all the interviewees. Respondents received information about the study and were allowed to withdraw from it without providing any reason. The transcripts were anonymized and stored at a secure online environment of XXX®.

Results

Study participants

In total, 26 RO professionals were interviewed (Figure 1). Demographic characteristics of respondents are listed in Table 1. Twelve (46.2%) of the interviewees consider themselves to belong to a minority or underrepresented group. Of these, 5 (42%) attributed it to their gender, followed by age (33%), race/ethnicity (25%), nationality (25%), religion/belief/lack of one or another (25%), and sexual orientation (17%). The majority of the interviewees were ESTRO members (84.6%).

Bounded responsibility regarding work engagement

In the interviews, work engagement was often described by the interviewees as an individual responsibility, determined by someone's motivation and mindset. At the same time, the stories of the interviewees demonstrated how their attempts to become engaged were hampered through inadequate DEI at work. They expressed the word 'trying' to describe the ways in which they attempt to become visible or to communicate their vision to others. One of the interviewees for instance expressed:

"I've tried speaking to quite a lot of different people or to find different ways (…) I've sort of asked advice from other people, and I've tried to make that information known. Sometimes, I think people listen, but I think overall people are just too busy."

Inequality and non-inclusiveness due to (un)conscious discrimination limited various interviewees' abilities to make themselves visible. Following multiple stories of the

interviewees, the lack of visibility lowered their self-assurance and their tendency to take initiative and express their voice, which consequently impacted their career options. The following interviewees for example addressed these inequal career opportunities:

> *"There are sometimes issues with gender biases. There's a kind of assumption that if you're a woman, you get married. So, I found it as a bit of a struggle trying to get PhD funding."*

Someone could be underrepresented and discriminated against in multiple ways, not only due to gender or nationality, but also due to years of experience or educational background. The (un)conscious bias of women of childbearing age was commonly mentioned by interviewees working in Italy, Poland, and Switzerland, as highlighted in the following quotes:

> *"I think that gender discrimination is quite common. A few days ago, I went to another hospital to talk with the chief. She was a woman, and she was saying that she prefers male doctors as their staff, because they won't ever get pregnant. I see that they go out for dinner or things like that, but in the end, since I'm a mother, it's not possible for me to do all these things. After work, I have to come home and manage the children, so it's not a possibility for me."*

> *"Women are underestimated, underestimation is a better explanation for this problem (...) The president is a guy who treats women as inferior. They think that women are responsible for coffee or tea or something like that. Frankly speaking, I can't imagine that women managed to become powerful. In our hospital, the main power is in the old man hands."*

The stories of the interviewees illustrate that difficulties in becoming engaged were related to value conflicts between interviewees' values in relation to their inclusiveness and some existing organizational values. Three main conflicts were raised, namely: 1) self-development vs.

efficiency, 2) togetherness vs. competition, and 3) people-oriented vs. task-oriented culture. Situations in which a low level of DEI was experiences, showed an imbalance between these three organizational vs. personal values (Figure 2).

Value conflict between self-development and efficiency

The first conflict was related to the organizational value of efficiency, which could limit the possibility of fulfilling interviewees' personal values of self-development.

Limited resources

Several interviewees illustrated situations in which healthcare organizations were tendentially focused on increasing efficiency. Those efficiency measures were implemented within a context of challenging economic circumstances - specifically highlighted by respondents from Italy and Poland - national politics and organizational management who oversees managing limited resources and understaffing (especially within small hospitals). One interviewee for example stated that the managers claim underfunding for new staffing and equipment:

> *"In my hospital, the chiefs are saying that there is no money, so you cannot ask for a new thing, for new doctors, or even for a new computer"*

Due to this understaffing, most interviewees experienced a heavy workload and time pressure. Working more hours than their contract requests was experienced by several interviewees as common. A few interviewees mentioned that the COVID-19 pandemic further aggravated the understaffing and work pressure amongst others bringing more challenging situations.

Limited time for personal needs

Due to a heavy workload, many interviewees reported the difficulty in creating time for their own personal needs in relation to their work. Several interviewees mentioned their unfulfilled

wish to become engaged in work projects which they are passionate about or initiatives that are beneficial for self-development. This is for instance demonstrated by the following quotes:

> *"There are always things which are sparking up, but then finding the time to actually do them is where it becomes a bit more difficult. Because we are too busy."*

> *"The problem is that the hospital has not enough money to hire scientists (...) and sometimes, for example, they refuse the financial support for publishing an article. It's unfair, because people are hired here to publish, and when it is accepted, you refuse to pay for it."*

In addition, interviews mentioned there is usually a limited time allocated to meeting and socializing with other colleagues, hampering networking activities needed for deploying career opportunities. Various interviewees stated that they experienced little support from others in their career since colleagues and managers do not find the time to 'listen' to their needs and how those needs could be met. One interviewee stated:

> *"And that's when I sent them an email to talk to them. It was COVID time, and we had no meetings. So, I never saw them, in fact (...) I said in the email, 'I would like to take only 10 minutes of your time, I have some research projects I'd like to talk to you about' and they always answered, 'we don't have time; we will come back to you later'."*

Consequently, various interviewees outlined situations in which a learning environment was missing, and self-teaching was the norm. As a result, the lack of support, often due to time and resource scarcity, hindered the employee's ability to grow professionally.

Value conflict between togetherness and competition

The second conflict that arose in the stories of the interviewees was the conflict between the value of competition within the organizational culture and their personal value of togetherness. Various interviewees described the hierarchical structures within their healthcare organizations, which regularly promote competition among colleagues. One respondent for instance mentioned:

> *"It occurs that if I do something more, I am forced to involve others who just take advantage of it. I should for example, write their names in the publications, but they didn't do anything."*

This mechanism was fed in part by the limited resources (described in the previous section) and subsequently career opportunities that need to be divided.

Limited communication

Interviewees mentioned various examples in which the hierarchy and competition decreased communication among colleagues and between employees and the management. Various interviewees stated that information was barely communicated through the management, leading to knowledge disparity among employees. Moreover, the limited involvement in decision-making was frequently mentioned; illustrated by the following quotes:

> *"The organization does not really share their goals. This makes us deviated from the bigger part. They do neither motivate nor inspire employees to be more engaged at work. Our opinion does not matter at all. So, we are not really engaged or have a connection to the organization.*"

> *"It's the power, because I politely try to say my opinion, but in the end, the decision is from the older, even if I have responsibility for the patient."*

A few interviewees addressed that they had no desire to speak up because they feel that their opinions are rarely valued. One respondent for instance addressed:

"I refuse to give my opinion, because I know they won't accept my opinion."

Following the stories of several interviewees, this lack of openness was further strengthened by feelings of fear caused by bossing around, abuse, and discrimination through the management; demonstrated by the following quote:

"Because there is no safe environment, because we cannot share our opinion or experience without getting critics, I automatically feel not involved. The culture in general is led by our chief. They are totally not open for discussions. That makes me sad because it is us and our small group of three or four. The hierarchy is so big that we, as female employees, do not matter at all."

The attempt to challenge the current leadership, was further hindered in some cases by the competitive advantage of fellow colleagues. An interviewee noted:

"I think that it is not fair. But they [the male colleagues] were happy because it was a good thing for them. Because you know, it's a very competitive place, everyone wants to stay. And if it's you with failure, then it means that it's not me. So, I don't think that we have a male colleague that has enough morale and is brave enough to say something, because at the end it is good for them."

This lack of communication was explicitly mentioned by interviewees that worked in healthcare organizations where an error culture prevailed. This means that when mistakes were made, people could rage or talk about colleagues behind their backs. As a result, people did not feel safe sharing confidential information, which is demonstrated by the following quote:

"To be honest, I feel a bit lonely in this setting. So, it would be really hard for me to put this burden on my back, to push it on my own. Because I can notice that some people, they're setting the sort of mindset that the less you will bark, the easier you will get through everything. It is easier to hide some sorts of confidential things, and to avoid showing the spotlight on yourself rather than taking any kind of actions or reporting anything that is wrong."

Colleagues then chose to keep certain information to themselves and only share it with close colleagues because when incidents were reported, gossip spread around the departments.

Lack of collaboration

Several interviewees implicitly mentioned that this lack of adequate communication within a department hindered the feeling of togetherness and consequently support and collaboration. Diminished feelings of togetherness were further increased by limited time for social activities (related to value conflict between self-development and efficiency) and by COVID-19. When social activities must be skipped, people feel less connected to their colleagues, hence it will be more challenging to build social relationships in the workplace. One interviewee reported:

"I think that after this COVID time, we need to get back to our previous habits of slightly more social events, for team building and bonding. We used to go out on a summer evening, and we haven't been able to do that recently. So, I'm looking forward to the next social event. I think that's an important thing, but nothing major, unfortunately, in the working structure."

Value conflict between people-oriented and task-oriented

The last conflict expressed in interviewees' stories was the conflict between the organizational value of a professional, task-oriented culture, and interviewees' value of a people-oriented culture.

Lack of personal attention

Most interviewees illustrated a task-oriented working culture within healthcare organizations which focuses on fulfilling work activities. The task-oriented culture was defined by interviewees as a culture in which the communication between employees was mainly efficient (related to value conflict between self-development and efficiency) with limited attention for emotional work (especially in cancer care) and the impact of work pressure on people's mental health. Some interviewees specifically brought up the importance of psychological support in the RO field, raising attention to the emotional work which is usually forgotten:

> *"The communication is very professional (...) there is no room for anything else, besides the professional communication. If this is something you like, then it's good. It helps also to get the work done. So, it's much more efficient, than if you have something else that you're dealing with besides work - then it becomes a problem for you because you can't talk to anybody about it at work. If you work almost 10 to 12 hours a day, and you have to keep your emotions to yourself, you can imagine how difficult that can be."*

In addition, the task-oriented culture was characterized by providing mainly negative feedback, drawing attention to improvements of tasks. Due to the lack of positive feedback, people often did not feel recognized for all the things they do well, as illustrated by the following quotes:

> *"If there's a kind of motivation, or if I've received some encouragement from my boss, I'd be more motivated (...) It's like if I receive something, then I will try to give even more."*

"I didn't hear some something positive from my chiefs in our hospital, in 10 years."

Lack of informal contact

The professional, task-oriented culture allowed limited space for informal activities and communication. Regardless of the country, informal contact was constrained by the COVID-19 pandemic. Some interviewees indicated the wish to have more breaks to stimulate informal communication to increase mutual understanding and support (related to value conflict between togetherness and competition). Examples were mentioned in which a lack of informal contact seemed to lead to less engagement and perpetuated prejudices. The importance of these small moments to catch up was often overlooked, while they are actually important factors in maintaining a good working environment. An interviewee noted:

"I think the problem is also that I don't find the time to just talk about private life [with other colleagues]. I think that's one point. But when I'm working, I'm working and it's hard to find time where we sit together for lunch or something [like that], to talk about private things."

Managing value-conflicts

To overcome hurdles at work, in which interviewees had to cope with situations in which they were unable to pursue their personal values in relation to inclusiveness and engagement because those conflicted with specific organizational values, interviewees expressed the need for resilience and initiative-taking. One interviewee for instance mentioned:

"We don't have money to organize meetings or congresses. But on the other hand, every once or twice a year, I organize meetings at my home, so I invited people to my home."

This quote shows that the interviewee creatively employed a new initiative to overcome the conflict between the organizational value for efficiency and their personal value for self-development. At the same time, interviewees described various examples in which these inventive attempts were also restricted by the organization:

"Well, sometimes, I do try every day, but they not always accept my proposals."

Discussion

A recent XXX survey showed that professionals in the field of RO in Europe score relatively low on DEI compared with their U.S. counterparts (21). Here we performed a qualitative study to gain a better understanding of situations in which low levels of DEI are experienced in the RO community in four European countries and how DEI can be improved by creating a more inclusive organizational culture.

This study showed that work engagement was often regarded by the interviewees as a personal responsibility. Though in reality, their opportunities for engagement were bounded by the structural power in a rigid organizational culture. The limited alignment of the organizational values with the individual values of RO professionals concerning DEI was found to hamper an inclusive organizational culture within RO departments. Conflicts between individual and organizational values were particularly present between the values 'self-development vs. efficiency', 'togetherness vs. competition' and 'people-oriented vs. task-oriented' culture. Although the tension between individual and organizational values concerning DEI within RO professionals was discussed among all participants, the value conflicts mostly experienced differed based on the specific circumstances of the participants. In this regard, differences due to

the national context were found. Since only four European countries were included in this study, the results might not cover all value tensions presented in the European RO workforce and conversely may portrait a geo-specific scenario. Scandinavian countries were for instance not taken into account. However, the aim of this qualitative study was not to give an overview of all value tensions, but to show some underlying mechanisms that explain the low levels of DEI amongst RO professionals in Europe.

The organizational values found in this study are similar to the value dimensions of the competing value framework of Quinn and Rohrbaugh (41) which are focused on 'having control'. This control focus within healthcare organizations could be a response to for example existing insecurities regarding economic deficits and COVID-19. In line, the interviews showed that external circumstances, such as lack of resources and the COVID-19 pandemic, worsened the conflicts by putting more emphasis on what the dominant management culture of white senior men values (i.e., efficiency, competition, and task-oriented), thus aggravating inequality and countering an inclusive organizational culture.

Value conflicts had even more impact on specific underrepresented groups who deal with (in)visible exclusion and discrimination due to oversimplified and derogatory views. Besides the common underrepresentation based on race/ethnicity, gender (including being a working mother), or people with a migration background, alternative pathways of underrepresentation were shown, including years of experience, educational background, and language use. When bias and discrimination go often unnoticed by those with privilege (42), the captured conflicting values are not properly discussed within healthcare organizations. Limited attention to these value-conflicts can, however, have far-reaching consequences. A study by Leiter (43) showed

that incongruence between individual and organizational values led to burnout by enhancing cynicism and inefficiency among nurses.

This study has several limitations that need to be addressed. Experience from earlier workplaces was not captured and we might have missed the worst experiences of those who ended up leaving the field. At the same time, we hope we are presenting the view of a minority, as we are aware of our negative selection bias of RO professionals with challenging DEI at work. In total, 26 interviews were conducted in this research. Normally, 12 interviews are recommended for saturation (44). However, this requires the presence of homogenous groups. In this case, the experiences of a variety of professionals with different professional roles and from four different countries were studied. Nevertheless, during data collection, saturation was reached regarding the implicit conflicting values that were present in the interviewees' stories. Moreover, there may have been a selection bias due to language - those with limited English knowledge may not have filled in the survey - and availability - those most affected by lack of DEI may have been less inclined to participate due to heavy workload or due to lack of belonging to the wider RO community. However, the sample of the respondents was found to be quite similar to the XXX survey (21) and was representative of the ESTRO distribution list (i.e., age, gender, main professions). The survey was also opened to non-ESTRO members, where demographic statistics are not available. Furthermore, the practical limitation of conducting interviews online to avoid financial and pandemic-related mobility restrictions, potentially hindered communication and transcription of the conversation by sporadic technical issues mainly due to an unstable internet connection. Finally, some participants were under the impression that the interview would be conducted in their mother tongue even though the selection process took place in English – here, some non-native English speakers may be more comfortable with written English than

expressing themselves orally. However, there are no indications that important information has been missed.

Proposed recommendations

In line with the suggestions of previous studies (21, 45-48), current measures in relation to DEI focus on integrating DEI in the organizations' core missions. With this, institutions should contribute to recruit and retain skilled professionals in an understaffed workforce, promote ethical standards, to consequently improve research and ultimately patient care. As an interviewee stated: *"When I'm very busy (…) I'm afraid that I can't keep the quality, that I miss something that would be important for the patient."* However, if these measures target on reaching certain quotas to obtain a more diverse workforce without promoting equity and inclusion, referred as tokenism, it will hardly succeed. As recommended by Jones et al. (49), organizing unconscious bias workshops help increase awareness of common microaggressions (such as underestimation, marginalization, gender harassment) and mitigating disparities (50). Yet alone, these workshops are not sufficient in solving the issue and can paradoxically awaken biases (51, 52).

This study shows that limited implementation of DEI at work can occur in situations where dominant organizational values (i.e., efficiency, competition, task-oriented) conflict with individual values (i.e., self-development, togetherness, people-oriented), hampering an inclusive organizational culture. Therefore, a specific organizational context which fosters 'controlling' values such as efficiency, competition, and a task-oriented approach, could be used as a warning signal that individual values with respect to inclusiveness and engagement at work are under pressure. Value differences are, however, mostly implicit and relate to how people understand themselves and their work (53). National and international professional RO societies could

promote awareness of low levels of DEI, how these can relate to the limited alignment of the organizational culture with individual values of inclusiveness and engagement and recognize those promoting DEI. Similar to DEI efforts within the U.S. academic RO departments, we expect that focusing resources and recognition for those promoting DEI, would help ensure a culture of inclusive excellence among the RO community (54).

Since values are lasting views on what people feel to be important (55), it is difficult to solve value disputes. Conflict resolution should therefore not be aimed at resolving individual value differences, but on facilitating cooperation despite existing value differences (53). More (informal) contact between different professional groups and specifically between professionals and the management would be helpful in better understanding each other's backgrounds and values, and to prevent simplified views. Our study showed a power imbalance in relation to these value differences and that dominant values are hardly challenged since some of these values are advantageous to those fearing losing their privileges or status quo. Professional societies could help tackling existing power differences by empowering underrepresented groups through, for instance, coaching, mentoring, and sponsoring support.

Although values are resistant to change, not all values are so fundamental. Monette (53) puts forward the importance of effective deliberation toward conflict resolution. Deliberation could help in obtaining a better understanding on how values could be open to reflection and judgement. ESTRO was mentioned a couple of times as an independent support system by the interviewees. ESTRO and other professional societies could support reflective practices by facilitating discussions about conflicting values and how these could be managed. In these discussions, arguments could be provided for alternative values. As inferred from the interviews, literature, and discussion among co-authors, information about other successful organizational

models that focus on more bottom-up and less hierarchical structures, and more long-term values could also be introduced.

Conclusion

This follow-up qualitative study on low DEI shows the importance of power balance in managing conflicting values within RO departments. To improve DEI and engagement in the workplace, attention should be given to individual values (self-development, togetherness, people-oriented) often dominated by organizational values (efficiency, competition, task-oriented), and how such value conflicts could be managed.

References

1. Dillard-Wright J, Gazaway S. Drafting a Diversity, Equity, and Inclusion Textbook Inventory: Assumptions, Concepts, Conceptual Framework. *Teaching and Learning in Nursing* (2021) 16(3):247-53. doi: https://doi.org/10.1016/j.teln.2021.02.001.
2. Bakker AB, Albrecht S. Work Engagement: Current Trends. *Career Development International* (2018) 23(1):4-11. doi: 10.1108/CDI-11-2017-0207.
3. Simbula S, Guglielmi D, Schaufeli WB. A Three-Wave Study of Job Resources, Self-Efficacy, and Work Engagement among Italian Schoolteachers. *European Journal of Work and Organizational Psychology* (2011) 20(3):285-304. doi: 10.1080/13594320903513916.
4. Avanzi L, Perinelli E, Bressan M, Balducci C, Lombardi L, Fraccaroli F, et al. The Mediational Effect of Social Support between Organizational Identification and Employees' Health: A Three-Wave Study on the Social Cure Model. *Anxiety, Stress, & Coping* (2021) 34(4):465-78. doi: 10.1080/10615806.2020.1868443.
5. Rosenkranz KM, Arora TK, Termuhlen PM, Stain SC, Misra S, Dent D, et al. Diversity, Equity and Inclusion in Medicine: Why It Matters and How Do We Achieve It? *Journal of Surgical Education* (2021) 78(4):1058-65. doi: https://doi.org/10.1016/j.jsurg.2020.11.013.
6. Kahn WA. Psychological Conditions of Personal Engagement and Disengagement at Work. *Academy of Management Journal* (1990) 33(4):692-724. doi: 10.5465/256287.
7. Baumruk R. The Missing Link: The Role of Employee Engagement in Business Success. *Workspan* (2004) 47(11):48-52.
8. Schaufeli WB, Bakker AB. Defining and Measuring Work Engagement: Bringing Clarity to the Concept. *Work Engagement: A Handbook of Essential Theory and Research*. New York, NY, US: Psychology Press (2010). p. 10-24.

9. Bates R. A Critical Analysis of Evaluation Practice: The Kirkpatrick Model and the Principle of Beneficence. *Evaluation and Program Planning* (2004) 27(3):341-7. doi: https://doi.org/10.1016/j.evalprogplan.2004.04.011.
10. Reina-Tamayo AM, Bakker AB, Derks D. Episodic Demands, Resources, and Engagement: An Experience-Sampling Study. *Journal of Personnel Psychology* (2017) 16(3):125-36. doi: 10.1027/1866-5888/a000177.
11. Campbell LG, Mehtani S, Dozier ME, Rinehart J. Gender-Heterogeneous Working Groups Produce Higher Quality Science. *PLOS ONE* (2013) 8(10):e79147. doi: 10.1371/journal.pone.0079147.
12. Person SD, Jordan CG, Allison JJ, Fink Ogawa LM, Castillo-Page L, Conrad S, et al. Measuring Diversity and Inclusion in Academic Medicine: The Diversity Engagement Survey. *Acad Med* (2015) 90(12):1675-83. doi: 10.1097/ACM.0000000000000921.
13. Cooper LA, Roter DL, Johnson RL, Ford DE, Steinwachs DM, Powe NR. Patient-Centered Communication, Ratings of Care, and Concordance of Patient and Physician Race. *Annals of Internal Medicine* (2003) 139(11):907-15. doi: 10.7326/0003-4819-139-11-200312020-00009.
14. Schoenthaler A, Montague E, Baier Manwell L, Brown R, Schwartz MD, Linzer M. Patient–Physician Racial/Ethnic Concordance and Blood Pressure Control: The Role of Trust and Medication Adherence. *Ethnicity & Health* (2014) 19(5):565-78. doi: 10.1080/13557858.2013.857764.
15. Raj SD, Clayton JT, Raj KM, Fishman SF, Fishman MDC. Motivation: How to Create a Cohort of Engaged, Energized, and Happy Radiology Trainees. *Clinical Imaging* (2021) 76:83-7. doi: 10.1016/j.clinimag.2020.12.019.
16. Morrison V, Hauch RR, Perez E, Bates M, Sepe P, Dans M. Diversity, Equity, and Inclusion in Nursing: The Pathway to Excellence Framework Alignment. *Nursing Administration Quarterly* (2021) 45(4).
17. West MA, Hwang S, Maier RV, Ahuja N, Angelos P, Bass BL, et al. Ensuring Equity, Diversity, and Inclusion in Academic Surgery: An American Surgical Association White Paper. *Annals of Surgery* (2018) 268(3).
18. Osborn VW, Doke K, Griffith KA, Jones R, Lee A, Maquilan G, et al. A Survey Study of Female Radiation Oncology Residents' Experiences to Inform Change. *International Journal of Radiation Oncology*Biology*Physics* (2019) 104(5):999-1008. doi: https://doi.org/10.1016/j.ijrobp.2019.05.013.
19. Chapman CH, Hwang W-T, Deville C. Diversity Based on Race, Ethnicity, and Sex, of the Us Radiation Oncology Physician Workforce. *International Journal of Radiation Oncology*Biology*Physics* (2013) 85(4):912-8. doi: https://doi.org/10.1016/j.ijrobp.2012.08.020.
20. Deville C, Cruickshank I, Chapman CH, Hwang W-T, Wyse R, Ahmed AA, et al. I Can't Breathe: The Continued Disproportionate Exclusion of Black Physicians in the United States Radiation Oncology Workforce. *International Journal of Radiation Oncology*Biology*Physics* (2020) 108(4):856-63. doi: https://doi.org/10.1016/j.ijrobp.2020.07.015.
21. xxxxx
22. Farkas L. Data Collection in the Field of Ethnicity 2017 (2017) [cited 2022]. Available from: https://ec.europa.eu/info/sites/default/files/data_collection_in_the_field_of_ethnicity.pdf.
23. Cho S, Mor Barak ME. Understanding of Diversity and Inclusion in a Perceived Homogeneous Culture: A Study of Organizational Commitment and Job Performance among Korean Employees. *Administration in Social Work* (2008) 32(4):100-26. doi: 10.1080/03643100802293865.
24. Findler L, Wind LH, Barak MEM. The Challenge of Workforce Management in a Global Society. *Administration in Social Work* (2007) 31(3):63-94. doi: 10.1300/J147v31n03_05.
25. Whitfield G, Landeros R. Supplier Diversity Effectiveness: Does Organizational Culture Really Matter? *Journal of Supply Chain Management* (2006) 42(4):16-28. doi: https://doi.org/10.1111/j.1745-493X.2006.00019.x.

26. Chuang YT, Church R, Zikic J. Organizational Culture, Group Diversity and Intra-Group Conflict. *Team Performance Management: An International Journal* (2004) 10(1/2):26-34. doi: 10.1108/13527590410527568.
27. Naidoo P, Martins N. Investigating the Relationship between Organisational Culture and Work Engagement. Problems and Perspectives in Management. *Special Issue: South Africa-2* (2014) 12(4):432-40.
28. Shuck B, Reio TG, Rocco TS. Employee Engagement: An Examination of Antecedent and Outcome Variables. *Human Resource Development International* (2011) 14(4):427-45. doi: 10.1080/13678868.2011.601587.
29. Chambers C, Alexis O. Creating an Inclusive Environment for Black and Minority Ethnic Nurses. *British journal of nursing (Mark Allen Publishing)* (2004) 13(22):1355-8. Epub 2005/02/03. doi: 10.12968/bjon.2004.13.22.17276.
30. Gershon RR, Stone PW, Bakken S, Larson E. Measurement of Organizational Culture and Climate in Healthcare. *The Journal of nursing administration* (2004) 34(1):33-40. Epub 2004/01/23. doi: 10.1097/00005110-200401000-00008.
31. Hofstede G. Dimensionalizing Cultures: The Hofstede Model in Context. *Online Readings in Psychology and Culture* (2011) 2(1). doi: https://doi.org/10.9707/2307-0919.1014.
32. Mays N, Pope C. Assessing Quality in Qualitative Research. *BMJ* (2000) 320(7226):50. doi: 10.1136/bmj.320.7226.50.
33. Suri H. Purposeful Sampling in Qualitative Research Synthesis. *Qualitative Research Journal* (2011) 11(2):63-75. doi: 10.3316/QRJ1102063.
34. Bernstein RS, Bulger M, Salipante P, Weisinger JY. From Diversity to Inclusion to Equity: A Theory of Generative Interactions. *Journal of Business Ethics* (2020) 167(3):395-410. doi: 10.1007/s10551-019-04180-1.
35. Golom FD, Cruz M. Context-Levels-Culture: A Diagnostic Framework for Consulting to Diversity, Equity, and Inclusion Change in Organizations. In: Shani AB, Noumair DA, editors. *Research in Organizational Change and Development*. Research in Organizational Change and Development. 29. Emerald Publishing Limited (2021). p. 201-34.
36. Maslach C, Leiter MP. *The Truth About Burnout: How Organizations Cause Personal Stress and What to Do About It*. San Francisco, CA, US: Jossey-Bass (1997). xi, 186-xi, p.
37. Denison DR, Mishra AK. Toward a Theory of Organizational Culture and Effectiveness. *Organization Science* (1995) 6(2):204-23. doi: 10.1287/orsc.6.2.204.
38. Pless N, Maak T. Building an Inclusive Diversity Culture: Principles, Processes and Practice. *Journal of Business Ethics* (2004) 54(2):129-47. doi: 10.1007/s10551-004-9465-8.
39. Braun V, Clarke V. Thematic Analysis. *Apa Handbook of Research Methods in Psychology, Vol 2: Research Designs: Quantitative, Qualitative, Neuropsychological, and Biological*. Apa Handbooks in Psychology®. Washington, DC, US: American Psychological Association (2012). p. 57-71.
40. Tavory I, Timmermans S. Abductive Analysis : Theorizing Qualitative Research. Chicago: University of Chicago Press (2014).
41. Quinn RE, Rohrbaugh J. A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organizational Analysis. *Management Science* (1983) 29(3):363-77.
42. Chodorow NJ. Glass Ceilings, Sticky Floors, and Concrete Walls: Internal and External Barriers to Women's Work and Achievement. *Constructing and Deconstructing Woman's Power*. Routledge (2002). p. 18-28.
43. Leiter MP. A Two Process Model of Burnout and Work Engagement: Distinct Implications of Demands and Values. *Giornale italiano di medicina del lavoro ed ergonomia* (2008) 30(1 Suppl A):A52-8. Epub 2008/08/15.

44. Guest G, Bunce A, Johnson L. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods* (2006) 18(1):59-82. doi: 10.1177/1525822X05279903.
45. Chapman CH, Jagsi R. The Ethical Imperative and Evidence-Based Strategies to Ensure Equity and Diversity in Radiation Oncology. *Int J Radiat Oncol Biol Phys* (2017) 99(2):269-74. Epub 2017/09/06. doi: 10.1016/j.ijrobp.2017.04.015.
46. Lancet T. Medical Professionalism and Physician Wellbeing. *Lancet (London, England)* (2021) 398(10303):817. Epub 2021/09/06. doi: 10.1016/s0140-6736(21)01966-8.
47. Kamran SC, Yerramilli D, Vapiwala N. No Talent Left Behind: A Silver Lining for Diversity in Radiation Oncology in the Post-Coronavirus Disease 2019 (Covid-19) Era. *Int J Radiat Oncol Biol Phys* (2020) 108(2):472-4. Epub 2020/09/06. doi: 10.1016/j.ijrobp.2020.05.055.
48. Skourou C, Sherouse GW, Bahar N, Bauer LA, Fairobent L, Freedman DJ, et al. Code of Ethics for the American Association of Physicists in Medicine (Revised): Report of Task Group 109. *Medical Physics* (2019) 46(4):e79-e93. doi: https://doi.org/10.1002/mp.13351.
49. Jones RD, Chapman CH, Holliday EB, Lalani N, Wilson E, Bonner JA, et al. Qualitative Assessment of Academic Radiation Oncology Department Chairs' Insights on Diversity, Equity, and Inclusion: Progress, Challenges, and Future Aspirations. *International Journal of Radiation Oncology*Biology*Physics* (2018) 101(1):30-45. doi: https://doi.org/10.1016/j.ijrobp.2018.01.012.
50. Periyakoil VS, Chaudron L, Hill EV, Pellegrini V, Neri E, Kraemer HC. Common Types of Gender-Based Microaggressions in Medicine. *Acad Med* (2020) 95(3):450-7. Epub 2019/11/07. doi: 10.1097/acm.0000000000003057.
51. Allison MT. Organizational Barriers to Diversity in the Workplace. *Journal of Leisure Research* (1999) 31(1):78-101. doi: 10.1080/00222216.1999.11949852.
52. Dobbin F, Kalev A. Why Diversity Training Does Not Work and Policies to Combat Bias in the Workplace More Effectively. *The Economist* (2021).
53. Monette P. Value Conflicts in Health Care Teams. *Ethical Deliberation in Multi-Professional Health Care Teams*. University of Ottawa Press (2001). p. 129.
54. Paradis KC, Franco I, Beltrán Ponce S, Chaurasia A, Laucis AM, Venkat P, et al. The Current State of Departmental Diversity, Equity, and Inclusion Efforts within Us Academic Radiation Oncology Departments. *International Journal of Radiation Oncology, Biology, Physics* (2022). doi: 10.1016/j.ijrobp.2022.06.071.
55. van de Poel IR, Royakkers LMM. *Ethics, Technology, and Engineering : An Introduction*: Wiley-Blackwell (2011).

Table and figure captions:

Table 1: Demographics and professional settings of the respondents who completed the survey (n = 131) and those interviewed (n = 26).

Figure 1: Flow diagram represents steps taken for data collection, DEI: Diversity, Equity, and Inclusion.

Figure 2: Conflicting organizational and personal values in relation to diversity, equity, and inclusion at work: efficiency vs. self-development, competition vs. togetherness and task-oriented vs. people-oriented. Situations with low levels of Diversity, Equity, and Inclusion (DEI) usually showed an imbalance between these organizational and personal values.

Supplementary material:

Supplementary material 1: Interview guide.

Supplementary material 2: Coding scheme.

Table 1: Demographics and professional settings of the respondents who completed the survey (n = 131) and those interviewed (n = 26)

	Levels	All surveyed (n (%))	Interviewed (n (%))
Gender identity	Female	71 (54.2)	13 (50.0)
	Male	59 (45.0)	13 (50.0)
	I prefer not to answer	1 (0.8)	-
Civil status	Married / In a civil union or long-term relationship	90 (68.7)	17 (65.4)
	Single / Divorced / Widowed	36 (27.5)	9 (34.6)
	I prefer not to answer	3 (2.3)	-
	Other	2 (1.5)	-
Age range (years)	<30	22 (16.8)	3 (11.5)
	31-40	63 (48.1)	11 (42.3)
	41-50	33 (25.2)	10 (38.5)
	51-60	11 (8.4)	2 (7.7)
	61-70	2 (1.5)	-
Country	Great Britain	36 (27.5)	7 (26.9)

	Italy	44 (33.6)	6 (23.1)
	Poland	21 (16.0)	7 (26.9)
	Switzerland	30 (22.9)	6 (23.1)
Workplace size	Large (for example, number of linacs ≥ 6)	44 (33.6)	6 (23.1)
	Medium (for example, between 3 and 5 linacs)	59 (45.0)	16 (61.5)
	Small (for example, the number of linacs in the department is ≤ 2)	28 (21.4)	4 (15.4)
Profession	Radiation Oncologist, or resident in Radiation Oncology	67 (51.1)	13 (50.0)
	Medical Physicist, or Medical Physicist trainee	24 (18.3)	4 (15.4)
	Radiation Therapy Technologist (RTT), or RTT trainee	19 (14.5)	4 (15.4)
	Clinical Oncologist, or resident in Clinical Oncology	10 (7.6)	3 (11.5)
	Biomedical Engineer, or Biomedical Engineer trainee	2 (1.5)	-
	Radiobiologist, or Radiobiologist trainee	1 (0.8)	1 (3.8)
	Other	8 (6.1)	1 (3.8)
Profession setting*	Clinical	111 (84.7)	25 (96.2)
	Research	67 (51.1)	13 (50.0)
	Academic	39 (29.8)	13 (50.0)
	Other	4 (03.2)	-
Seniority level	Head of department or group leader	23 (17.6)	5 (19.2)
	In training	27 (20.6)	4 (15.4)
	Senior staff member	30 (22.9)	9 (34.6)
	Staff member	47 (35.9)	7 (26.9)

	Other	4 (3.1)	1 (3.8)
Belong to minority or underrepresented group	Yes	48 (36.6)	12 (46.2)
	No	83 (63.4)	14 (53.8)
ESTRO member	Yes	104 (79.4)	22 (84.6)
	No	27 (20.6)	4 (15.4)

*Respondents could select more than one answer.