

BD₄QoL

BIG DATA FOR QUALITY OF LIFE

Newsletter #7 January '24 – June '24

1. ABOUT THE BD4QoL PROJECT

BD4QoL aims at **improving head and neck cancer survivor's Quality of Life** through person-centred monitoring, post-treatment support and personalised follow-up.

BD4QoL takes advantage of **technologies for social communication and unobtrusive personal monitoring** embedded in smartphones to **improve head and neck cancer survivor's Quality of Life**. Physical activity, social interactions, sleep, and health data are automatically collected by a mobile app for over two years after treatment and will be analysed to early intercept quality of life deterioration and health risks.

The project will last until December 2024. Would you like a closer look on how BD4QoL works and is implemented? See the project's presentation video: <https://youtu.be/90YmWxtytn0>

Give a look at the BD4QoL [leaflet](#) and [presentation](#) to know more about the first projects results!

For more information about BD4QoL, visit: www.bd4qol.eu

2. BD4QoL EVENTS

6TH Plenary meeting

On February 22nd -23rd the BD4QoL consortium met in Bilbao at the premises of Deusto University. The meeting was held in mixed modality, in person and virtually, hosted by University of Deusto. The objectives were:

1. Check the status of the project
2. Check the status of WP6
3. Plan the work for integration into the Regional Patient Health folder
4. Check the analysis of data from the occupational database and plan results delivery.
5. Status and plans for publications and dissemination activities, IPRs to be checked and finalized, plans for IPRs contribution, Plans for the exploitation, agreements and possible contribution
6. WP10: prepare the periodic reporting and the review
7. Take crucial decisions regarding next amendment request
8. Preparation of next review meeting March 2024

3. BD4QoL NEWS

How digital technologies are changing the way in which evidence is generated in Medicine



Through its involvement in BD4QoL, CSS has gained valuable insights into how emerging digital technologies can impact the generation of evidence in medicine. The traditional gold standard for demonstrating the safety and efficacy of a clinical intervention, particularly when involving drug administration, has been the principles of Evidence-Based Medicine (EBM).

With the advent of digital technologies, especially the ones based on artificial intelligence (AI), a shift in the paradigm becomes evident. The conventional approach to evidence generation has traditionally prioritized testing well-defined and robust research hypotheses on the collected data. In contrast, AI-driven EBM places a greater emphasis on discovering new evidence and generating new hypotheses through the analysis of collected data. The value is inherent in the data that needs to be extracted. This prompts a consideration of how medical evidence will be generated in the future and the potential need for adjustments to methods and standards.

The practical experience gained during the project highlights a significant distinction between these two approaches. While traditional EBM thrives in well-defined and controlled experimental conditions, the domain of digital technologies is often characterized by uncontrollable external factors. This was evident in the project, where challenges arose from necessary software updates in consumer technology occurring during a multi-year research project and for the fact that applications designed for patients had to coexist, in their devices, with other applications meant for everyday use.

These challenges, while posing new obstacles, also present opportunities to establish innovative methods for reliably producing evidence in a constantly evolving field. The dynamic nature of this landscape calls for adaptive strategies and opens the doors to novel approaches in evidence generation.

BD4QoL Expands Patient Enrollment, Overcomes Challenges, and Advances Mobile App Usage with DOTSOFT Support



In a significant milestone for the groundbreaking European project BD4QoL, the consortium proudly announces a substantial increase in patient enrollment from partner clinical sites. This surge underscores the growing impact of BD4QoL in reshaping post-treatment experiences for individuals who have overcome head and neck cancer.

Partnering with clinical sites across Italy and the UK, BD4QoL leverages mobile applications and artificial intelligence to collect and process daily data on participants' activities and habits. Despite the challenges posed by the dynamic nature of digital technologies and external factors, the project has demonstrated resilience and adaptability.

One key contributor to the project's success is DOTSOFT, a vital partner actively addressing challenges and providing essential support. DOTSOFT plays a crucial role in ensuring the seamless operation of the mobile applications, empowering patients to make optimum use of the technology. The company's



dedication extends to resolving issues promptly, fostering a positive environment for both patients and medical specialists.

As the number of enrolled patients continues to rise, Inetum, the cloud infrastructure provider, collaborates closely with DOTSOFT and other partners to enhance the quality of data collected. The ongoing development of a robust quality framework by Inetum allows for autonomous detection and analysis of patient interactions with monitoring applications, ensuring a comprehensive understanding of behavior and adherence to prescriptions.

In this ever-evolving landscape of health technology, BD4QoL remains at the forefront, not only improving the lives of those who have faced head and neck cancer but also pioneering innovative solutions for the future of evidence-based medicine. Together, with the support of dedicated partners, BD4QoL continues to revolutionize self-care and redefine the standards of personalized well-being.

Europe's Beating Cancer Plan: the importance of initiatives to improve the quality of life of cancer patients and survivors



On 31 January 2024, the Europe's Beating Cancer Plan conference took place in Brussels. During the event, the main commitments and actions of the Plan were recalled by Commissioner Kyriakides.

The Europe's Beating Cancer Plan is one of the funding pillars of the European Health Union and represents the Union's devotion to improve cancer prevention, treatment, and care. It includes 10 flagship initiatives and 32 supporting actions focusing on four key action areas, among which "quality of life of cancer patients and survivors".

In particular, the Plan recognises the challenges that cancer survivors may experience, citing, for examples, unmet psychosocial needs, issues related to rehabilitation and emotional distress, and underlines the importance of focusing on "how well" they live. Moreover, the Plan mentions the potential that new technologies and digitalisation can bring to research and innovation.

The above shows the ongoing commitment of the European Union towards improving the QoL of cancer survivors exploiting, among others, the potential of the new technologies. At the same time, it also demonstrates the alignment of the BD4QoL project with the priorities at EU level.

Indeed, improving the QoL of cancer survivors and exploiting the potential of the new technologies are two themes at the core of BD4QoL, whose aim is to enhance the QoL of patients who have successfully completed a treatment pathway for head and neck cancer by fostering the adoption of Artificial Intelligence-assisted mobile applications specifically focused on Head and Neck Cancer.

DOTSOFT Excels at BEYOND Expo with a Focus on Enhancing Healthcare through Big Data



DOTSOFT partner successfully participated in the recent BEYOND Expo, one of the foremost technology and innovation events in Europe. Held annually, BEYOND Expo draws industry leaders, innovators, and technology enthusiasts to explore the latest advancements and emerging trends in the tech world.

During the expo, DOTSOFT not only showcased our cutting-edge solutions but also took an active part by delivering an insightful talk on the Big Data for Quality of Life (BD4QoL) project. This ambitious initiative aims to harness the power of big data to significantly improve healthcare outcomes and enhance the quality of life across Europe.

The presentation highlighted the innovative approaches and the significant progress of the BD4QoL project, detailing how big data analytics can lead to better health interventions and patient care. The discussion opened up a dialogue among healthcare professionals, data scientists, and policymakers about the future of healthcare and the pivotal role of big data.

DOTSOFT has been proud to contribute to the global conversation on technology and healthcare at BEYOND Expo and look forward to continuing our work towards advancing healthcare through technological innovation.

25–31 May is the European Week Against Cancer (EWAC)



The European Week Against Cancer (EWAC) is an international awareness initiative, held annually from 25 to 31 May, organised by the Association of Cancer Leagues in collaboration with its member leagues and partners across Europe.

Its objective is to unite Europe in the fight against cancer and inspire action against it by, among others, providing an opportunity to learn about cancer policy and research, key prevention strategies, and the experiences of patients and survivors.

Among others, the 2024 edition aims at:

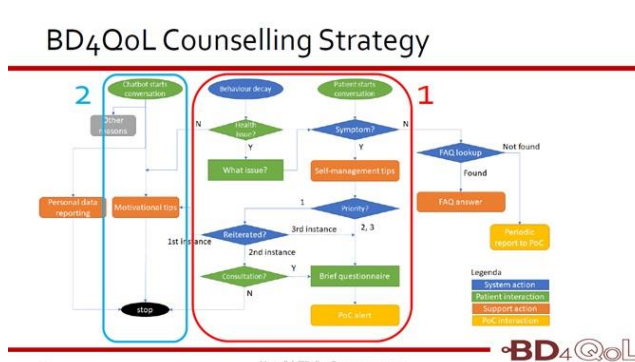
- Amplifying understanding of cancer prevention strategies and the significance of early detection
- Collaborating at all levels, from grassroots initiatives to policy advocacy, to combat cancer and improve patient outcomes.

Each day the EWAC will concentrate on a different aspect linked to cancer control like, for example, “digital health & care”, “research”, “patients and survivors”.

With its work, BD4QoL fits perfectly in this scenario. Indeed, several of its objectives are aligned with the themes at the core of the initiative. To mention a few:

- BD4QoL aims at demonstrating that early detection is feasible through innovative approaches
- BD4QoL aims at empowering and supporting cancer survivors in monitoring and managing post-treatment consequences, orienting their behaviours and activating preventative and early interventions
- BD4QoL aims at building new knowledge from systems medicine approaches combining medical with new type of data (e.g., emotional data) for monitoring survivors’ quality of life.

BD4QoL contributes to training Medical Doctors in the deployment and use of digital health technology for supporting patient Quality-of-Life after cancer treatment



Partner MME, co-organized in cooperation with the Association of Medical Doctors of the Province of Parma a Workshop titled “Advancements in Quality-of-Life monitoring after oncology treatment”.

The Workshop has been organized as part of the national Continuing Medical Education program (ECM), assigning formative credits to Medical Doctors, thus leveraging BD4QoL

results and contributing to train MDs towards the deployment and exploitation of new digital technologies investigated by BD4QoL and beyond.

The workshop agenda has been articulated into three interrelated parts:

- Dr. Simona Bui, from the University Hospital of Parma, discussed how QoL in oncological patients represents a kind of “fourth dimension” of the disease and how clinical pathways should be adapted to include it
- Prof. Stefano Cavalieri, from Fondazione IRCCS Istituto Nazionale dei Tumori di Milano and University of Milan, presented the BD4QoL RCT protocol, related to a multi-centric randomized study to monitor quality of life in patients treated for HNC, based on innovative digital technologies
- Eng. Franco Mercalli, from MultiMed Engineers, discussed digital technology solutions for supporting quality of life in long-term cancer survivors, focussing in particular on passive data monitoring and chatbot interventions

The event has been attended by 50 Medical Doctors, who completed the final evaluation questionnaire, as well as representatives from local medical associations, including the local chapter of LILT (Italian League of Fight Against Cancer).

BD4QoL predictive model



The main goal of machine learning models in healthcare is to accurately estimate patient risk. For a model to be practical, it should not only have good discriminative performance but also be well-calibrated so that the predicted probabilities are meaningful and interpretable. So model development starts by defining the right probability to be estimated.

When making predictions for patients, we often encounter outcomes that depend on other conditions. For example, we may want to predict the quality of life two years after survivorship, but this measurement is conditional on the patient surviving for those two years. Traditionally, patients who did not survive are excluded from the model development, which can introduce bias.

In the BD4QoL project, we developed a methodology based on conformal predictions that includes all patients in the model development process, making the algorithm less biased and more fair. This approach allows us to predict not only the probability of having a poor quality of life in the future but also the probability of surviving, and the joint probability of experiencing any adverse event for all patients. This new method can be valuable for informing patients, clinicians, and hospital management. By knowing which patients will need help to improve their quality of life or require other specialised care, resources can be allocated more efficiently.

This result was only made possible by the joint effort of partners who shared their valuable data across borders, including Istituto Nazionale dei Tumori, University of Mainz, and University of Bristol, for researchers at the University of Oslo and University of Deusto. The peer-reviewed publication will soon be available to the whole community.



4. **BD4QoL PUBLICATIONS**

Do you want to know more about the first outputs of the BD4QoL project? Have a look at [deliverables published](#) by BD4QoL project so far!

5. **BD4QoL activities on social network**

BD4QoL social channels are constantly updated with all the **latest news**. Follow us for more updates!

- [X](#)
- [Instagram](#)
- [LinkedIn](#)
- [YouTube](#)