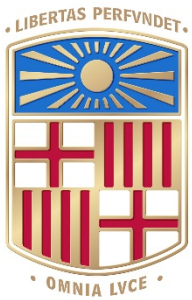

UNIVERSITAT DE BARCELONA

Final Degree Project

Development of a customizable website to follow-up physical rehabilitation of cardiovascular patients at home

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Abstract

The growing demand for remote patient monitoring solutions, especially in the management of chronic conditions such as cardiovascular diseases, has highlighted the need for flexible and accessible digital tools for home monitoring. This project presents the development of an open-source exercise monitoring website to support cardiac rehabilitation programs, specifically tailored for the East Galway Roscommon Integrated Care Hub in Ireland. The platform enables patients to complete a periodic diary of physical activities, including exercise type, duration, and intensity, among others, and allows them to view their progress through graphs. It also allows healthcare professionals to monitor the patients' exercise data, send feedback messages, and export the data in a conventional spreadsheet format. The website was tested with simulated patients and professionals, with more than 2.000 data and messages transferred without error. Feedback confirmed the platform's reliability, ease of use and compatibility with all major browsers.

A key objective of the project was to make the tool implementable and adaptable by healthcare professionals without the need for web development skills. To achieve this, a comprehensive implementation and customization manual has been developed, allowing healthcare professionals in a variety of clinical settings to adapt the platform to their specific needs. Given that existing telemedicine tools are often generic and inflexible, this project presents a practical and low-cost solution for healthcare professionals to monitor the progress of their patients and offer them personalized support.

Key words: Home monitoring, customizable website, cardiac rehabilitation, physical exercise.

Resum

L'augment de la demanada de solucions de monitoratge remot de pacients, especialment en la gestió de malalties cròniques com les malalties cardiovasculars, ha posat de manifest la necessitat d'eines digitals flexibles i accessibles per al seguiment a domicili. Aquest projecte presenta el desenvolupament d'un lloc web de codi obert per al seguiment de l'exercici físic, destinat a donar suport a programes de rehabilitació cardíaca, específicament dissenyat per a l'East Galway Roscommon Integrated Care Hub a Irlanda. La plataforma permet als pacients completar un diari periòdic d'activitats físiques, incloent-hi el tipus d'exercici, la durada i la intensitat, entre d'altres, i els permet veure el seu progrés a través de gràfics. També permet als professionals sanitaris monitorar les dades d'exercici dels pacients, enviar comentaris i exportar les dades en un format convencional de full de càlcul. La pàgina web es va provar amb pacients i professionals simulats, amb més de 2.000 dades i missatges transferits sense errors. Els resultats van confirmar la fiabilitat de la plataforma, la facilitat d'ús i la compatibilitat amb tots els navegadors principals.

Un dels objectius clau del projecte era fer que l'eina fos implementable i adaptable pels professionals sanitaris sense necessitat de coneixements en desenvolupament de webs. Per aconseguir-ho, s'ha elaborat un manual complet d'implementació i personalització, que permet als professionals sanitaris, en diversos entorns clínics, adaptar la plataforma a les seves necessitats específiques. Atès que les eines de telemedicina existents sovint són genèriques i inflexibles, aquest projecte presenta una solució pràctica i de baix cost perquè els professionals sanitaris puguin monitorar el progrés dels seus pacients i oferir-los un suport personalitzat.

Paraules clau: Monitoratge domiciliari, web personalitzable, rehabilitació cardíaca, exercici físic.

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1. Introduction

This first introductory section presents the objectives of the *Development of a customizable website to follow-up physical rehabilitation of cardiovascular patients at home* project, as well as its purpose, intended users, and its scope and limitations.

1.1. Objectives of the project

The main goal of this project is to develop a flexible, low-cost, and open-source telemedicine tool that can be customized and operated by any healthcare professional with minimal digital skills. In this way, it aims to address the lack of apps that are adapted to each specific rehabilitation programme and promote personalization to improve adherence of patients.

To achieve this, the project has been structured around the following specific objectives:

- **Develop an open-source exercise monitoring website**
  To develop a website for the use and needs of cardiac rehabilitation professionals at the East Galway Roscommon Integrated Care Hub (Galway, Ireland) to improve patient adherence and participation in the program, and to enable follow-up.
- **Create an implementation and customization manual**
  To provide a user-friendly manual that allows any healthcare professional with no training in website development to implement the website as is or to customize it to any specific application field.
- **Disseminate the results through a scientific article and make the platform publicly available**
  To share the project outcomes and make the website template available worldwide.

1.2. Purpose and intended users

Telemedicine home monitoring of physical rehabilitation in cardiovascular patients is currently an underused practice, despite strong clinical evidence supporting its benefits. In patients with atherosclerotic cardiovascular disease and heart failure, exercise training is associated with a reduction in hospitalization, adverse cardiovascular events, and mortality rates [1-3]. As a result, the European and American Guidelines recommend patients with cardiovascular disease to enroll in cardiac exercise rehabilitation [2,3].

The purpose of this project is to develop a customizable and accessible tool that enables the follow-up of physical rehabilitation in patients with cardiovascular diseases. The project also aims to address the need for specific platforms for each rehabilitation or monitoring program, as the existing applications and websites available for home monitoring are mostly generic and cannot be easily adapted to each specific program. Currently, the conventional option would be to develop a fully customized solution, which usually involves high development costs.

Therefore, the website is aimed at all those health professionals who need a system to monitor in their patients' parameters but lack the resources to develop a platform from scratch. Although it is primarily designed for cardiac rehabilitation programs, it is extensible to other medical specialities as it can be adapted to fit their needs thanks to the developed implementation and customization

manual. It is also targeted at the patients of these professionals, which is why the platform is designed to be user-friendly and to motivate patients to adhere to the monitoring program, by self-tracking their own progress.

1.3. Scope and limitations

The project scope includes the development of an exercise monitoring website that adapts to the needs of the East Galway Roscommon Integrated Care Hub healthcare professionals, as well as testing of the website with simulated users. It also covers the creation of an implementation and customization manual designed for healthcare professionals with no experience in website development, and the dissemination of results through a preprint of a scientific article and by making the website template and backend available.

Nevertheless, some elements are excluded from the project scope, as the integration with external Electronic Health Record (EHR) systems. Similarly, it is also excluded the use of international standards to ensure interoperability, as the website is intended for standalone use, with the aim of supporting professionals and patients in local self-monitoring context, rather than contributing data to larger studies. Additionally, applying these standards would not be practical in this framework as the website is intended to be easily customized. Moreover, the project does not include clinical trials or long-term evaluations of patient outcomes related to the of the website.

Some limitations also apply to the project. First, time constraints have limited the number of functions to be developed, as additional functions could have been implemented with more time. Second, some healthcare professionals may find the customization of the platform difficult if they are not familiar with technologies, even if they follow the manual.

The project will be carried out at the *Unitat de Biofísica i Bioenginyeria* of *Universitat de Barcelona* and it is expected to be completed in a period of 9 months, from October 2024 to June 2025.

2. Background

2.1. Technological context

Patients have always been the focus of medical care, and patient-centred medicine is an approach that emphasizes considering patients' goals, preferences and economic resources to favour their improvement [4]. In this context, telehealth has been increasingly popular in recent years. Telehealth refers to the use of digital technology to overcome time and location constraints, thus expanding the accessibility and reach of traditional medical services [5]. It comprises a wide variety of platforms, such as mobile applications, websites, wearable devices, and videoconference tools. These technologies can improve medical care by offering teleconsultations, remote patient monitoring (RPM), telehomecare and Point-of-care (POC) medicine [6].

Remote patient monitoring enables patient monitoring outside of clinical settings, which can significantly improve an individual's quality of life. It involves the use of medical wearables, websites and apps for uploading data, or devices that measure and send data, such as blood pressure, among others [7]. All these technologies allow healthcare professionals to monitor their patients more frequently and intervene when necessary, without having to wait for the patient to come to the clinic to check their progress. Home-based exercise therapy monitoring is an example of RPM, and research indicates that it can improve adherence to exercise programs and enhance clinical outcomes [8].

Despite its potential, telehealth also faces different challenges because it requires a certain level of technological capabilities, and it can imply increased workload for healthcare professionals. Additionally, potential issues with data privacy and security can arise [9].

2.2. State of the art

In these recent years, the development of healthcare monitoring platforms and devices has been on the rise and they are continuously evolving and improving. These systems allow users to track their own health parameters, or to track and share them with their healthcare providers. Examples of monitored parameters include heart rate, activity levels and sleep quality, among others.

2.2.1. Commercial wearables

Wearable devices such as smart watches (e.g., Apple Watch, Garmin, Fitbit, Polar) and rings (e.g., Oura Ring) have gained popularity due to their ability to track physical activity and physiological parameters such as heart rate or sleep. In this way, they offer monitoring capabilities in real-time and also integration with digital platforms such as Apple Health or Garmin Connect. These devices use micro-electro-mechanical system (MEMS) based miniature motion sensors like accelerometers, gyroscopes and magnetic field sensors to measure activity related signals [10].

Different studies have evaluated the accuracy of these devices. For example, in a study comparing Fitbit and Garmin smartwatches, it was demonstrated that both devices offered excellent accuracy in measuring heart rate at rest and recovery (Mean Absolute Percentage Error, MAPE $\leq$ 3 %) [11]. However, their accuracy decreased during peak exercise [11]. Regarding sleep monitoring, the Oura Ring has demonstrated the highest sensitivity for wake detection (68.6%), outperforming Fibit and Apple Watch [12].

2.2.2. Wearable health monitoring systems

More advanced wearable health monitoring systems can comprise different types of sensors that can be integrated in clothes, elastic bands, or directly attached to different locations of the body, and can capture physiological signals such as electrocardiogram (ECG), electromyogram (EMG), heart rate (HR), body temperature, and blood pressure, among others [13].

One example is VitalPatch® by VitalConnect, a medical patch that provides continuous monitoring of ECG, heart rate, heart rate variability, respiratory rate, and body temperature, and other parameters [14]. The patch is disposable and sends data to a cloud platform that healthcare providers can access to monitor their patients.

Continuous glucose monitors (CGMs), such as the Dexcom G7 and Abbot FreeStyle Libre 3, are also examples of widely used wearable systems. These devices allow real-time glucose monitoring, transmit the data to smartphones, and alert users when glucose levels become dangerous, helping people with diabetes to manage their disease [15,16].

2.2.3. Mobile health applications

Nowadays, there are many available health and fitness applications, such as Apple Health, Samsung Health, Google Fit and Fitbit. Additionally, many of these apps allow the syncing with wearable watches or devices, as mentioned in Section 2.2.1. The specific capabilities of health platforms may differ in the type of medical or fitness data they collect, how it is obtained and how users can manage it. Figure 1 shows the most tracked aspects of fitness and health among mobile users in the US in March 2024, where it can be observed that exercise is the most tracked (35%), followed by blood pressure and heart rate (both at 29%) [17].

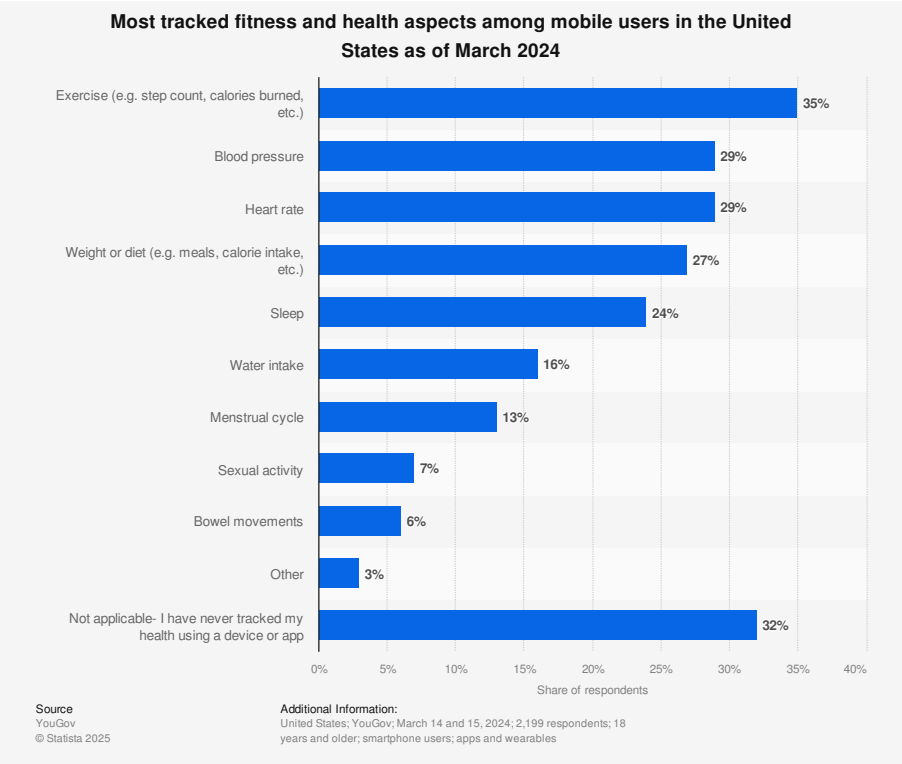

Figure 1. Most tracked fitness and health aspects among mobile users in the US as of March 2024 [17]

Interestingly, Apple offers CareKit, which is an open-source framework to help developers build iOS apps for managing care plans related to chronic diseases or health tracking [18]. It also allows to share data with trusted contacts, such as healthcare professionals. However, these apps are limited to iOS users and cannot be made available on other platforms like Android.

2.2.4. Telemedicine platforms

Telemedicine platforms that enable communication via teleconferencing and support the delivery healthcare services remotely have also been on the rise. One of the most well-known platforms is Teladoc Health, one of world's largest telemedicine companies, which offers general medical consultations, mental health support, dermatology services, and chronic disease management, among others [19]. Amwell (American Well) is another major player that provides similar services, offering specialist consultations and chronic condition management [20].

Other telemedicine platforms specialise in specific fields. One example is Physitrack, a platform that provides tools for healthcare professionals to prescribe exercise programmes, offer educational videos and track the progress of their patients, similar to the functionalities to be achieved with the development of this project's platform [21].

2.2.5. Limitations and challenges

Despite the advantages of the aforementioned devices and systems, there are also limitations. Figure 2 exemplifies the frequent barriers to a successful implementation of telemedicine: patient privacy, data confidentiality, technological complexity, cases of misdiagnoses, issues with controlled substances and prescriptions, risk of fraud and abuse, medical liability and data accuracy. Of all these challenges, it is worth mentioning that technological complexity, particularly from the user's experience, can play an important role in the success. Since the usual population of interest for monitoring is the elderly, remote patient monitoring systems will be effective in the healthcare context if they are simple and easy-to-use.

Figure 2. Common barriers to healthcare support through telemedicine [22]

2.3. Situation analysis

Cardiovascular diseases (CVDs) are the primary cause of mortality and disability in the WHO European region [23]. The impact of CVDs on healthcare systems is also significant, which it is estimated to cost €282 billion annually in the European Union alone [24]. Additionally, it is estimated that 80% of premature heart attacks and strokes are preventable [25], meaning that greater emphasis on CVD prevention and management could save thousands of lives each year.

To address this need, the guidelines recommend that patients with CVD participate in cardiac exercise rehabilitation programs [2, 3]. These programs include prescribed exercise by a physician, modification of cardiac risk factors, a psychosocial assessment and an outcome evaluation [26].

In Ireland, cardiovascular disease claims more than 9,000 lives each year [27]. Within the Irish healthcare system, the East Galway Roscommon Integrated Care Hub offers care for patients requiring cardiac rehabilitation. Currently, most referrals to the program are post-hospital discharge, after a myocardial infarction or heart failure admission. The cardiac rehabilitation program they follow is structured in four phases [28]:

- Phase I occurs during hospitalization and focuses on giving patients support and basic information about cardiovascular diseases and its risk factors.
- Phase II takes places immediately after discharge and aims to further elaborate on the information that the patient received during Phase I.
- Phase III consists of a structured exercise and education program, which is prescribed by a cardiac nurse and a physiotherapist after a clinical evaluation. Patients participate in a program of 10 to 12 weeks of supervised group exercise, either in a gym (one session per week) or at home.
- Phase IV represents the long-term maintenance of the new acquired habits of the patient, self-managed by them.

The home-based option is intended for patients who are unable to attend to in-person classes, but also for those who want to track the exercise they do throughout the week in addition to the one in-person session. However, the current follow-up system has some limitations. Most of the follow-up is done through conversation when the physiotherapist sees the patient in the group session. The patients fill a weekly self-report, with the exercise they have done and some other parameters. However, during the limited weekly class time, it is hard for the healthcare staff to provide recommendations and guidelines and give feedback to all the patients. Additionally, the progress that the patients are doing is not quantifiable.

This situation highlights the opportunity to develop a user-friendly telemedicine platform that enables real-time monitoring of the exercise program, to track the patient's progress in a quantifiable way, and to allow communication between the patients and physiotherapists throughout the week. Thus, ensuring that all patients follow the physical activity guidelines and increase engagement and adherence to the program, by being able to self-monitor themselves.

The East Galway Roscommon Integrated Care Hub is a specific case where the developed platform is needed. However, this problem is generalizable to many different medical specialities that need

an easy, low-cost and customizable platform to track their patients. This is why the platform has been built with the aim that it can later be customized and adapted to other medical specialities that have similar needs.

3. Market analysis

This section explores the market context in which this project stands, focusing on market growth and demand drivers, key trends, challenges and opportunities, and analysing the competitive landscape.

3.1. Market growth and demand drivers

This project proposal lies at the intersection of different markets, all of which are experiencing an accelerated growth.

The Remote Patient Monitoring (RPM) market was valued at 27,72 billion USD in 2024 and is expected to grow at a Compound Annual Growth Rate (CAGR) of 12,7% until 2030 [29]. This growth is driven by many factors, but mainly by the increase in chronic conditions such as cardiovascular diseases and respiratory disorders, as well as an ageing population [30]. Thus, vital signs monitoring and remote patients monitoring devices are expected to have a major impact on the future of the global healthcare market by improving the management of chronic diseases, providing early warning signs and tracking progress.

In parallel, the digital health tracking apps market is also experiencing rapid growth. The market size is currently estimated to be 18.642,2 million in 2025 and is projected to grow to 81.457,3 million by 2035, at a CAGR of 15,9% during the period [31]. The rise of these platforms is mainly due to increasing health awareness among the population and the high usage of wearable technology and real-time smart-phone based health monitoring [31]. Nevertheless, the category is also gaining popularity thanks to the emphasis on preventive medicine by many governments and institutions, for example the European Union.

3.2. Key trends

There are several trends that are driving the evolution of the RPM, digital health, and exercise tracking markets. First, the integration of Artificial Intelligence (AI) and machine learning into RPM systems and exercise health trackers can provide valuable insights into the evolution of an individual's health, as well as enable proactive interventions with predictive alerts [30-32]. There is also an emphasis on developing non-invasive or minimally invasive RPM technologies, as well as making them more intuitive to increase adoption rates [30].

At the same time, another trend is the use of smartphones and wearable devices to improve patient engagement and support preventive care strategies, by making real-time health tracking more accessible outside of clinical settings [30]. As mentioned in the previous section, this shift is also supported by governments and institutions prioritizing preventive healthcare.

Finally, technologies such as blockchain are being explored to improve data transparency and secure medical information in healthcare environments [30].

3.3. Market challenges and opportunities

As in any market, there are also challenges. One of the main difficulties in RPM is the integration with existing healthcare systems. The lack of standardization across platforms can make it difficult

to achieve interoperability and thus limit its potential [30]. Another challenge is data privacy and security [31, 32]. Therefore, strong regulatory frameworks and strict data protection must be ensured in order to gain the trust of users, minimizing concerns about data breaches or a potential misuse of their personal health data. Lastly, the complexity of some of health monitoring systems can act as a barrier for individuals who are less familiar with technology, like older adults, which can limit market growth in certain demographics [32].

However, there are many market opportunities for growth. The integration of AI, cloud computing, and the Internet of Things (IoT) present opportunities for the development of more advanced and personalized digital solutions [32]. Additionally, making these systems simple and easy to use can help overcome some of the barriers mentioned above.

3.4. Competitive analysis

Both the remote patient monitoring market and the digital health tracking apps market are highly competitive markets. Large medical technology companies dominate the RPM market, which have different RPM systems, some of them specialized in monitoring certain diseases. Abbot Laboratories, for example, has monitoring solutions for anticoagulated patients (*CoagClinic*™) and patients on ventricular assist device (VAD) therapy (*VADWatch*™), among others [33]. AMD Global Telemedicine, has *AGNES Connect* ®, a platform that enables to remotely share medical device data and participate in live video conferences, as well as other functionalities [34]. Biotronik offers *BIOTRONIK Home Monitoring*, which focuses on cardiovascular patients with implantable devices, to allow physicians to review their cardiovascular data remotely [35]. Other relevant companies in the monitoring market are Boston Scientific Corporation, Medtronik and Teladoc Health [30,36].

In the digital health tracking apps market, leading tech companies such as Apple and Google dominate the field. Apple holds an estimated 18-23% of the market share, followed by Google's Fitbit (14-18%), and Samsung (10-14%) [31]. These companies offer integration with wearable devices and many health monitoring features. For instance, Apple Health integrates with Apple Watch to enable real-time tracking of vitals, such as ECG and blood oxygen levels [37]. They also have strong privacy controls and ensure regulatory compliance.

Nevertheless, the market lacks for simple apps or websites that can be adapted for a specific rehabilitation or monitoring program. This gap presents an opportunity to create user-friendly solutions that healthcare professionals can implement and customize to monitor their patients.

4. Conceptual engineering

4.1. Problem definition

Most applications and websites available for home monitoring are proprietary and generic. As a result, they cannot be easily adapted to each specific rehabilitation protocol. In addition, older patients can have difficulties using the platforms if they are too complex. Nevertheless, there is a need for healthcare professionals to follow up their patients' rehabilitation at home or monitor them for other purposes. Patients also need to communicate with their healthcare professionals, self-monitor their progress and receive feedback, in order to improve their adherence and overall health. The ideal solution to solve this problem would be an open-source, customizable, low-cost platform that can be implemented by healthcare professionals who are not experts in website development.

4.2. Functional and non-functional requirements

The solution must meet some functional and non-functional requirements. Most of these requirements were defined in collaboration with the professionals at the *East Galway Roscommon Integrated Care Hub*, whose insights and research into their patients' needs were essential in defining this solution. The functional requirements are as follows:

- **Data submission**: patients should be able to submit the following data through an intuitive interface: date of exercise, warm-up and cool-down completion, type of exercise, duration of exercise, Borg scale rating, perceived effort, number of steps and distance.
- **Data visualization:** patients and healthcare professionals should be able to visualize submitted data in dynamic graphs with different filtering options. The platform must include at least duration of exercise and Borg scale rating graphs.
- **Content viewing:** the platform should allow the uploading and viewing of informational documents, images and videos.
- **Messaging system:** the platform should include a messaging system for communication between healthcare professionals and patients.
- **Data exportation:** healthcare professionals should be able to download the data of their patients in an Excel spreadsheet format.
- **Role-based access control:** the platform should implement role-based access control, distinguishing between patients and healthcare professionals.
- **User account management:** healthcare professionals should be able to create and manage new user accounts.

On the other hand, the non-functional requirements are:

- **User-friendly interface:** the user interface must be intuitive and user friendly, especially for elderly users (e.g., large fonts, single-screen, colour-blind-friendly palettes)
- **Multi-device compatibility:** the solution should be usable on multiple devices (e.g., phones, tablets, desktops)
- **Secure data storage and anonymity:** the solution should securely store data and maintain patient anonymity.

- **Customization and updates**: the system should support updates and allow customization.
- **Ease of implementation by healthcare professionals:** healthcare staff with no experience in website developing should be able to implement and customize the solution.
- **Manual for implementation and customization:** the solution should include a tutorial to help healthcare professionals set up and customize the platform.

4.3. Study of possible solutions

Once the functional and non-functional requirements have been described, different options have been explored to find the optimal solution. The two main approaches considered were to develop a mobile application or a web-based platform. Although both options have the capacity to implement most of the required functionalities, each approach differs in terms of usability, implementation and complexity.

One the one hand, mobile apps offer several advantages, as they can send notifications to users (e.g., reminders), can access the phone's sensors (e.g., camera, GPS, …), do not depend on web browsers, and can offer a more integrated and fluid user experience. However, developing a mobile application for our purpose also presents some drawbacks. Firstly, although there are non-code app builder platforms that could make it easy for healthcare professionals to customize the app, the process of publishing an app can be long and complex, and sometimes they are not approved for publication on the first attempt. Additionally, publishing involves costs: Google Play requires a one-time registration fee of 25 USD and the Apple App Store 99 USD/year [38, 39]. From the perspective of patient end-users, apps require installation and configuration, a process that could be more challenging for older users. Finally, updating mobile apps is less efficient, as users have to update the new version of the app on their devices, a process that does not always occur automatically.

On the other hand, the development of a website offers a more practical solution. Some of the advantages offered are that they can be accessed from any device with internet connection (phones, tablets, or computers), without needing to be installed, and can be accessed from different types of browsers. This also implies that they can be accessed from devices with bigger screens, providing better visualization for those who experience vision problems. Unlike apps, they are easy to update and when any changes or improvements are made to the website they are automatically reflected to all users. Lastly, there are many no-code website builder platforms that offer intuitive interfaces suitable for non-web experts to customize their website. However, websites also have some limitations, for instance they do not have access to mobile-specific features such as push notifications.

In view of these considerations and keeping in mind that the solution should be implementable by healthcare professionals, the development of a web-based platform was deemed to be the most appropriate solution for this project.

4.4. Reasoning of the selected solution

One of the main goals of this project is to make the platform accessible and customizable for other healthcare professionals. Therefore, as mentioned above, developing a website was the approach selected because it offers easier implementation and customization, and an easier updating process. This option provides the means to achieve the functional and non-functional requirements while minimizing the technical challenges for healthcare professionals, thus making it the most suitable option for the project's goals.

After choosing to develop a website, several platforms were evaluated to determine which was the best one for our purpose. The following criteria were used:

- **Transferability:** the platform should allow the website to be easily cloned or transferred, without the owner having to intervene. There should also be no risk for the original site to be modified.
- **Ease of customization:** the platform should allow non-technical users to adapt the site, by using a codeless interface, drag-and-drop elements, …
- **Developer extensibility:** the system should have the option to add custom code to enhance the site with advanced functionalities if needed.
- **Data storage or backend integration:** the platform should enable data storage within itself or through integration with external databases and data managing platforms.
- **Cost:** there is a preference for free or low-cost solutions to ensure affordability.
- **Data privacy and security:** the platform must comply with standard data protection practices, such as SSL encryption.

Some of the most relevant hosted website builder platforms were identified and compared. The platforms included WordPress.com [40], Wix [41], Squarespace [42] and Webflow [43]. Webflow, although less popular than WordPress.com, Wix or Squarespace, was considered for its functionality to clone and share complete website templates, a feature that was especially relevant for this project as mentioned before. Table 1 shows a comparison between the different platforms with the selected criteria.

Table 1. Comparison of hosted website builder platforms (WordPress.com, Wix, Squarespace, and Webflow)

	Frontend platform			
Feature	**WordPress.com**	**Wix**	**Squarespace**	**Webflow**
Transferable	Content can be exported and imported, but full site transfer (themes, plugins, settings) is not supported. A full transfer requires the involvement of the owner, and manual rebuilding is still required.	Allows sites to be duplicated and transferred, but it requires the owner's involvement.	Allows sites to be duplicated and transferred, but it requires the owner's involvement.	Sites can be published as free templates on *Made in Webflow* and fully cloned by other Webflow users.

Customizable	Yes	Yes	Yes	Yes
Easy to use	Intermediate	Yes, beginner-friendly.	Yes, beginner-friendly.	Intermediate
Developer extensible	Yes, it allows custom-code.	Yes, it allows custom-code.	Yes, it allows custom-code.	Yes, it allows custom-code.
Data storage or backend integration	Limited without plugins.	Built-in support for custom databases using Velo. External database connections possible.	No built-in database support. Requires integration external databases (e.g. via custom code)	Data can be stored in Webflow CMS but it is very limited. Allows integration with external databases via custom code, webhooks, or third-party tools.
Cost	Free plan available. Most features require a paid plan. E.g. Plugins require a paid *Business* plan (~40€/ month) or higher.	Free plan available. Advanced features require paid plans (starting at ~15€/month)	No free plan. Paid plans start at ~15€/month.	Free plan available. Custom code and other functionalities require a paid site plan (starting at ~19.29€/ month).
Data privacy and security	SSL encryption[1], DDoS protection[2]. No found mention of SOC 2 Type II certification[3].	SOC 2 Type II certified. SSL encryption, DDoS protection.	SOC 2 Type II certified. SSL encryption, DDoS protection.	SOC 2 Type II certified. Offers SSL encryption, DDoS protection.

Given the comparison above, each platform presents its own advantages and disadvantages. However, Webflow was chosen primarily for its web cloning features. This platform offers the possibility to post complete websites in their 'Made in Webflow' section, and to allow other Webflow users to clone this site freely. This feature is key in this project, as the decision-making was mainly guided by the aim to ensure that the solution can be implemented by healthcare professionals with no experience in website development.

[1] SSL/TLS encryption: an internet security protocol that encrypts data transmitted between a user and a web server.
[2] DDoS protection: techniques used to detect and mitigate or avoid the effects of Distributed Denial-of-Service (DDoS) attacks, which attempt to flood the targeted machine or resource with excessive requests to overload the system.
[3] SOC 2 Type II certification: independent audit report on how a cloud-based service provider handles sensitive information. It is a security standard that ensures organizations store and process data securely.

Nevertheless, selecting this option implies the need to look for a separate platform for the backend and API logic of the website, because Webflow's capabilities in this sense are limited. After evaluating various backend solutions, the platform Xano was selected because its 'Snippets' feature. This feature allows a Xano user to create and share various database structures and API endpoints all as a group, and to be easily cloned by other Xano users.

It is important to note that the solution developed is open-source, but not in the traditional sense (e.g. via GitHub) because it was specifically designed to be implemented by healthcare professionals rather than developers, and therefore no-code platforms were used. Consequently, we consider it open source in practice, as it is published on these platforms under open licenses (CC0) and can be easily cloned.

In conclusion, the combination of these two platforms provides a strong framework for the website development, as it offers ease of customization of the frontend without coding, the ability to develop all necessary functionalities, and adaptability to different contexts.

4.5. General architecture of the solution

The system architecture is based on the integration of two platforms selected in the previous section: Webflow and Xano. Webflow hosts the frontend, in other words, hosts the visual part of the website, and it enables modifying those visual elements. Xano, on the other hand, is the platform that serves as backend, containing the website's logic, database and API endpoints[4]. Table 2 shows a summary of each platform purpose and features for this project.

Table 2. Roles, features and hosting of Webflow and Xano

	Webflow **Frontend (User Interface)**	**Xano** **Backend (Database and logic)**
Purpose	Host the visual elements and user interface of the website.	Manage the logic, user authentication, database operations and data storage.
Features	A simple and intuitive interface can be designed with accessibility in mind, and a responsive design can be created so that the website works well across desktops, tablets and smartphones.	Xano provides REST API endpoints that communicate with Webflow and handle user authentication. Allows the creation of databases in the platform to enable storage of data.
Hosting	Hosted on Webflow servers	Hosted on Xano infrastructure

Webflow and Xano interact via REST APIs (Application Programming Interfaces), which enable the communication between them. APIs facilitate the transmission and retrieval of data between the frontend and the Xano database. For instance, when a user submits a form with their exercise data or views personalized content, APIs send or request information to the database in Xano. The following steps provide an overview of the system flow:

1. User accesses the website through a browser, loading the Webflow front-end.

[4] An API endpoint is a specific URLs that the frontend can call to interact with the backend.

2. Frontend makes API requests to backend (Xano), to submit new data or fetch existing data.
3. Depending on the action:

- If the user submits data (e.g., completing the exercise form, or sending a message)
    - Xano processes the request and authenticates the user.
    - The submitted data is stored in the appropriate table of the database.
- If data is presented to the user (e.g., exercise graphs page, or viewing messages):
    - Xano authenticates the user and retrieves the corresponding data from the database.
    - The data is returned and rendered on the Webflow interface.

Figure 3 illustrates a simplified representation of these interactions.

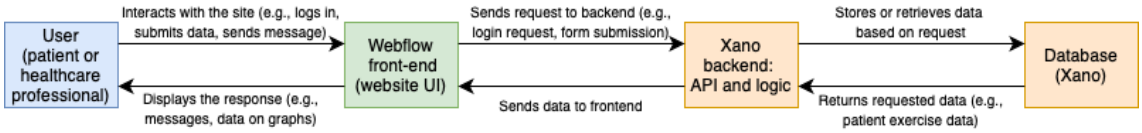

Figure 3. Simplified data flow diagram of the system architecture. Own creation.

The backend structure (the database) includes three tables: the 'users' table, which contains usernames, passwords, and group classification (patient or healthcare professional); the 'messages' table, which stores communications between patients and healthcare professionals; and the 'data_entries' table, which stores data related to the patient's exercise (e.g., exercise type, duration, Borg scale rating). Figure 4 presents an Entity Relation (ER) diagram, to visualize the relationship between the tables.

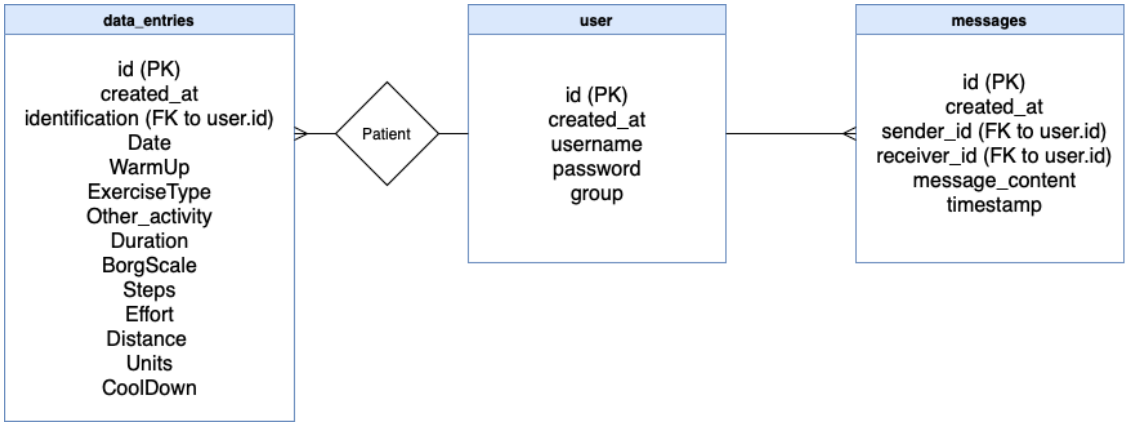

Figure 4. Entity Relation (ER) diagram. Own creation.

The two main modules of this platform, Webflow and Xano, are connected. While this connection can be done in different ways, the specific functionalities of this website required the use of custom JavaScript code to make API calls. Nevertheless, this approach is only supported under a Webflow's paid site plan. Therefore, to enable the functionality of the website, such as user

authentication and data submission, upgrading to a paid plan is necessary. As of May 2025, the cost of this plan is approximately 147,42 €/year, which represents a minimal cost of less than 0.5 €/day. While this introduces a constraint, it is a necessary trade-off to ensure the solution meets the needs of healthcare professionals and allows for easy implementation.

5. Detailed engineering

This section provides a detailed technical description of the system, the functionalities that have been implemented, the design and contents of the manual, the tests that have been performed and how the platform has been disseminated for use.

5.1. Technical Description of the System

The system was developed using a combination of no-code and custom code approaches. The goal was to build a functional, secure and user-friendly platform, while keeping in mind that it had to be easy to implement by non-technical users. Three main technologies were used: Webflow (for frontend design and layout), Xano (for backend and API management), and JavaScript (to add functionalities and integrations).

5.1.1. Technologies and frameworks used

As introduced earlier, Webflow was used to build the frontend. Its visual editor enabled:

- Creation of structured pages and components
- Design adaptation for mobile, tablet and desktop views
- Storage and management of information documents
- Data entry with forms and interaction through buttons
- Visual styling (e.g., colors, layouts, hover effects)

Webflow automatically generates the website's core HTML (for structure), CSS (for styling), and JavaScript (for built-in interactions and animations). However, to achieve advanced functionalities such as API integration or dynamic data rendering for the charts, custom JavaScript was created for most pages of the website using the 'Custom Code' section (accessible only with a paid plan, as previously noted). This custom JavaScript enabled:

- Sending REST API requests (e.g., for login, data submission, etc.)
- Handling session tokens for secure session management
- Rendering visual data (charts, messages)
- Role-based redirection to appropriate user pages (patient or healthcare staff)
- Custom filtering logic (by date, units, or perceived exertion)

For visualizing exercise data, the Chart.js library [44] was used to create interactive bar charts, while JavaScript was used to populate these charts with the retrieved data.

Lastly, the backend development in Xano enabled the creation of a relational database and the setup of API endpoints with embedded logic and authentication.

5.1.2. Frontend structure

The frontend is composed of several pages built using Webflow's native features. Some of the pages are accessible only to patient users, while others are reserved for healthcare professionals, a mechanism known as role-based access control, implemented using JavaScript. The pages include:

- **Log in page**: accessible to anyone with the website URL. Allows users to log in.

- **Role redirect page**: an intermediate page not visible to users, which performs redirection based on the user's role (patient or healthcare professional)
- **Patients' home page**: enables messaging with healthcare professionals. Accessible only for patient users.
- **Enter data page**: allows patients to submit daily exercise data. Accessible only for patient users.
- **My track page**: displays exercise data in chart format. Accessible only for patient users.
- **Patients' information page**: shows information documents. Accessible only for patient users.
- **Staff's home page**: enables messaging with patients. Accessible only for staff users.
- **My patients page**: allows staff to view exercise data from all patients in charts. Accessible only for staff users.
- **Staff's information page**: displays information documents. Accessible only for staff users.

Figure 5 shows the structure and relationships between these pages within the website.

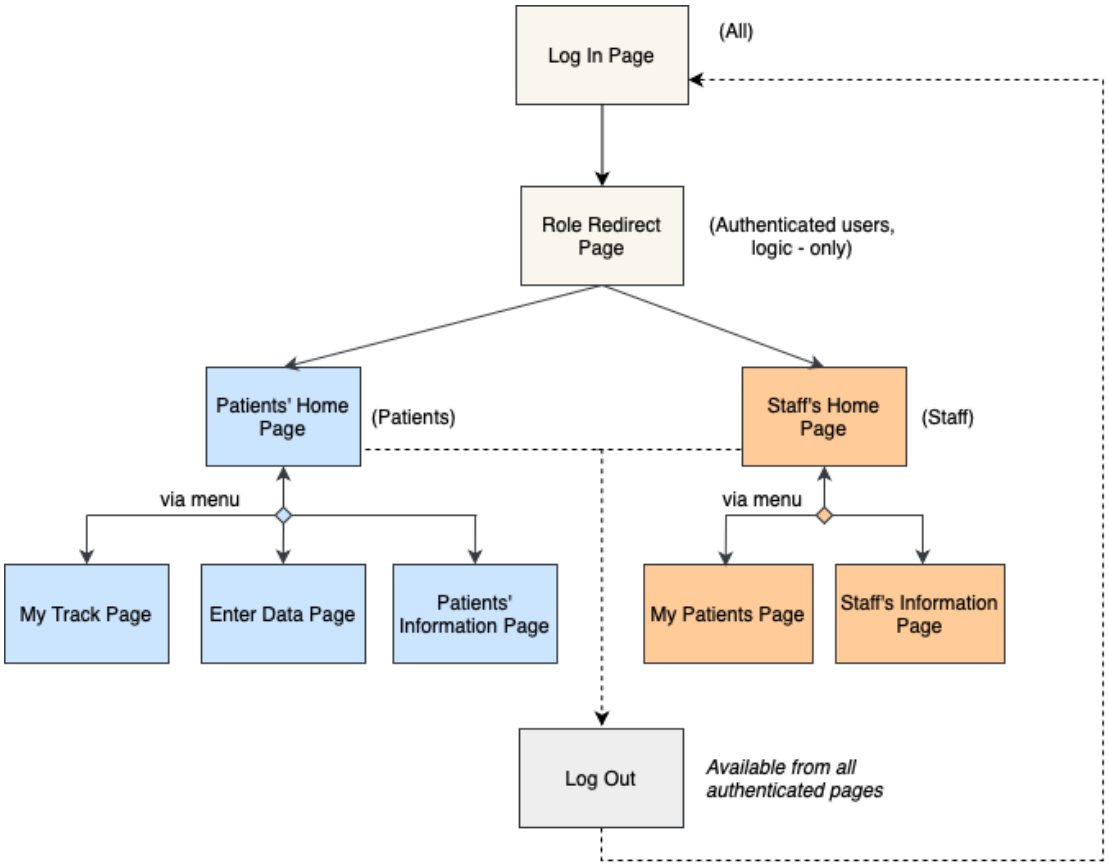

Figure 5. Page diagram of user navigation. Own creation.

The decision to separate pages by user role (patient or healthcare professional), rather than using dynamic role-based content on shared pages, was made to simplify implementation for healthcare professionals. This makes it easier to explain in the tutorial and allows the independent customization of each view.

As mentioned in the previous section, custom JavaScript was created for most pages in the 'Custom Code' section to manage how users interact with the website and how it connects with the backend system through API endpoints. The main features implemented using JavaScript are:

- Login process: when a user enters their login details, JavaScript sends this information to a Xano API endpoint to verify the credentials.
- Role-based access: after a successful login, the code checks the user's role (patient or healthcare professional), which is retrieved from a Xano API endpoint, and redirects them to the appropriate home page.
- Data handling: patients submit daily exercise data through forms, which is sent via JavaScript to a Xano API endpoint. Similarly, exercise data is retrieved through API calls and visualized in charts using Chart.js. Filtering options (e.g., 'Last week', 'Last month', etc.) are also implemented through custom JavaScript.
- Messaging: patients and staff can send messages to each other. JavaScript sends these messages via API requests to Xano, retrieves messages, and displays them on the screen.

Figure 6 shows the complete user flow diagram of the website for both patient and staff users.

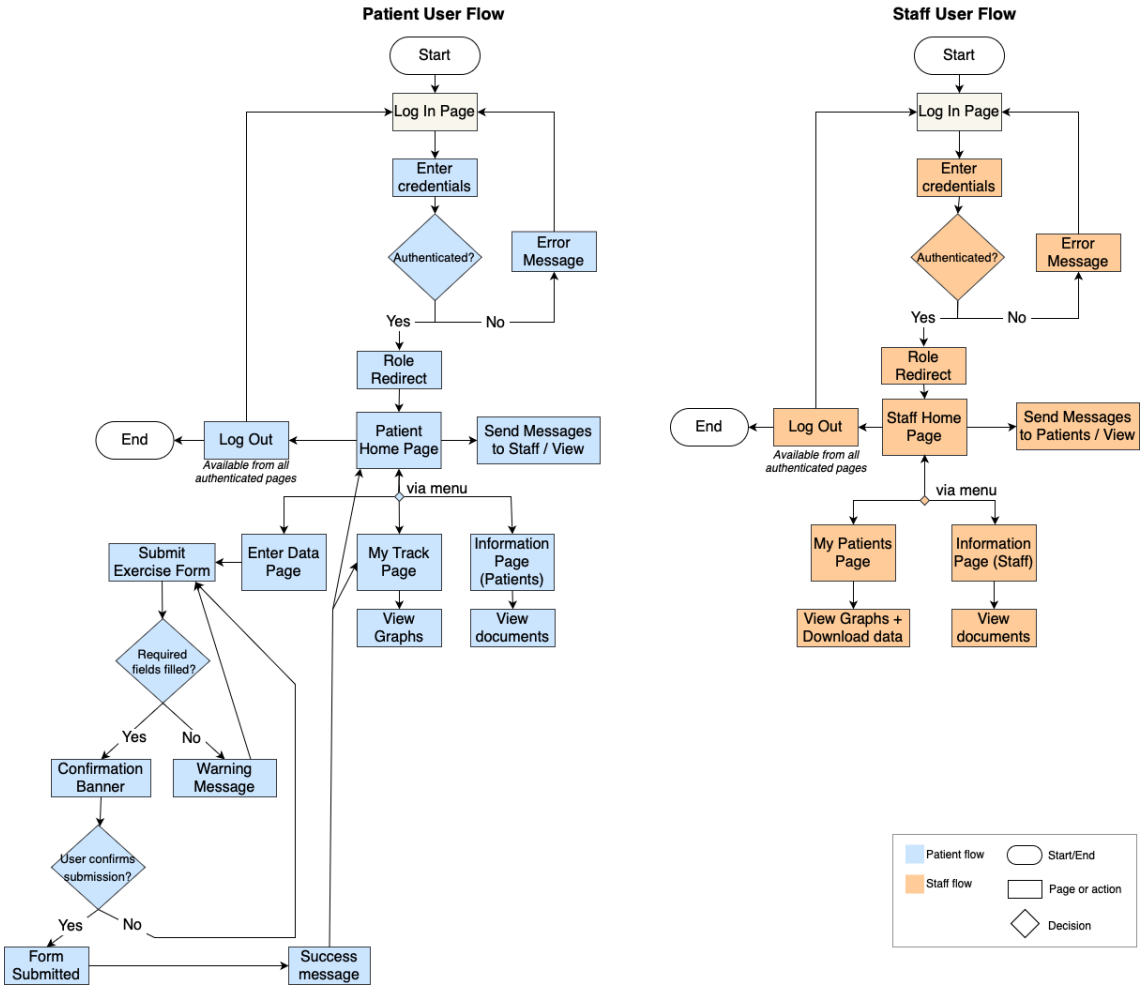

Figure 6. User flow diagrams for patients and healthcare professionals. Own creation.

The design of the frontend was based on the initial website mock-up, which served as a visual guide throughout development. This mock-up is included in Annex A. Figure 7 displays of the login interface of the website.

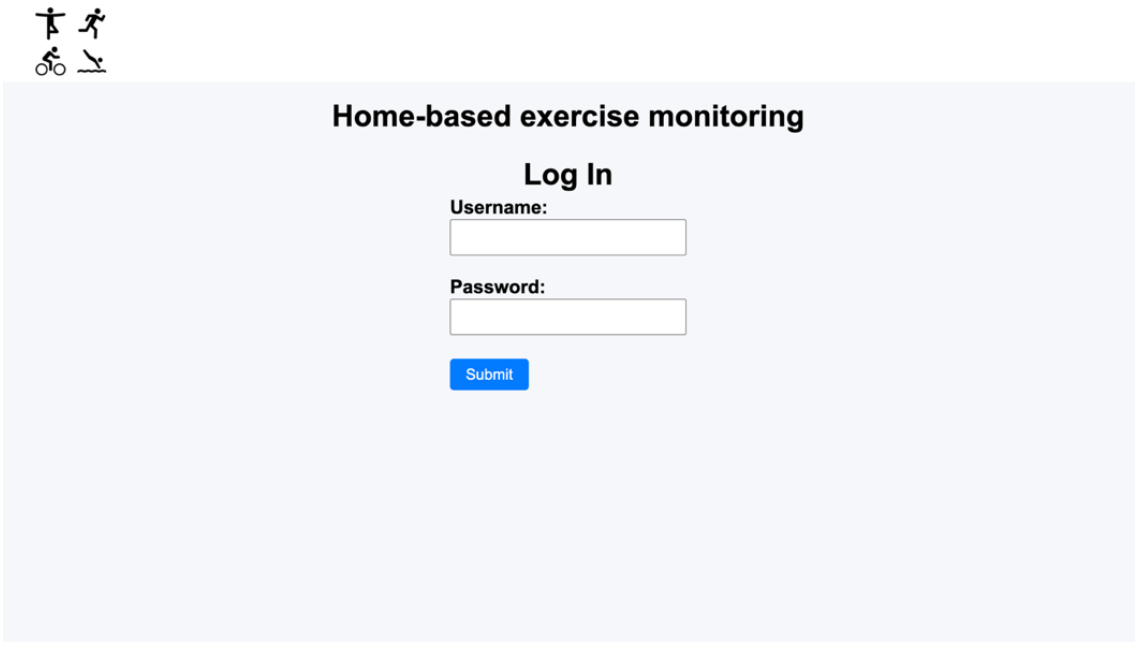

Figure 7. Login interface of the website. Own creation.

5.1.3. Backend structure and API communication

The backend was developed in Xano, a no-code platform that allows database management, logic execution, and API communication.

The database model, as introduced in the *Conceptual engineering* section (see ER diagram in Figure 4), consists of three relational tables: a 'user' table (for users), a 'data_entries' table (for exercise data), and a 'messages' table. These tables are structured with primary and foreign keys, defined data types, and validation constraints configured within Xano. Xano also supports one-to-many relationships (e.g., one patient to many exercise records), field-level validations (e.g., required fields, data formats), authentication, and conditional logic for data operations (e.g., role-based permissions). A detailed description of each table is available in Section 12.2.1 (Database table structures) of Annex B.

As mentioned before, communication between the frontend (developed with Webflow and JavaScript) and the backend (Xano) occurs through REST API endpoints. The full list of API endpoints, including their methods, authentication requirements, access and description, can be found in Section 12.2.2 (API endpoints) of Annex B.

Although more specialized endpoints could have been created to reduce logic and JavaScript in the frontend, the design choice was to centralize most logic within a small set of API endpoints. This approach simplifies the implementation process for future non-technical users by minimizing the number of API URLs they need to configure. The tutorial provides clear instructions that allows users to simply copy and paste the links, without interacting with the full website's code.

API requests are made through JavaScript on the frontend using standard HTTP[5] methods, such as GET and POST, and the data payloads are sent in JSON format. If the user is authenticated and authorized, Xano processes the request and performs the corresponding backend action.

All API endpoints, except for the '/auth/login' endpoint, implement token-based authentication[6]. This means that when a user logs in with a valid username and password, the '/auth/login' endpoint returns a JSON Web Token (JWT)[7], which is stored in the browser's memory using 'sessionStorage'[8]. This token must then be included in 'Authorization' header[9] of all subsequent API requests to verify that the user is allowed to access the requested data or service. The token is valid for 24 hours and, since it is stored in 'sessionStorage', users are automatically logged out when the browser window is closed, enhancing security.

Although API endpoint URLs are visible in browser developer tools, unauthorized access is prevented by backend authentication validation. Every request is verified by Xano using the provided token, and access is granted or denied based on the user's identity. These security measures protect user data and prevent unauthorized interactions or potential malicious access.

5.2. Implemented functionalities

The following functionalities were implemented in the website to support home-exercise monitoring:

- User authentication: a login page, where users can log in and be redirected to either the patients' or staff's pages depending on their role.
- Messaging system: to allow bidirectional communication between healthcare and staff. In this system, patients can only message staff and staff can view and message all patients, as well as view messages sent by other staff to a patient.
- Exercise data tracking: patients can enter their daily exercise data (e.g., date, intensity, type, duration, warm-up, cool-down, subjective effort)
- Data visualization: patients can view in graphs the data about their daily exercise activities during a selected time period, and can apply other filters (e.g., activity type, borg scale filter, distance's units filter). Similarly, staff can visualize the same data, but for all patients, using a dropdown to select patient.
- Data export: staff can export patients' data in Excel format.
- Information pages: two separate information pages, one for patients and one for staff, to make different documents available for staff and for patients.

[5] HTTP (HyperText Transfer Protocol) is the protocol used for transferring data over the web. It defines how data is formatted and transmitted, using methods like GET (to retrieve data) or POST (to send data).
[6] Token-based authentication is a method where users receive a special code (called token) after logging in. This token acts like an identifier and is used to prove the user's identity in future requests.
[7] JSON Web Token (JWT) is a commonly used standard for user authentication. It works by encoding information about the user into a string (the token).
[8] 'sessionStorage' is an object that lets you store data temporarily in the browser, while the browser tap is open. Once closed, the data is deleted automatically.
[9] Authorization header is a part the HTTP request that includes credentials (like a token), so the backend can verify who is making the request.

A detailed description with images of the different pages and functionalities of the website can be found in Section 12.3.1 (Website template description) of Annex C.

Nevertheless, the healthcare professionals at the East Galway Roscommon Integrated Care Hub wanted to implement some additional functions that were not as scalable or generalizable as the rest of functionalities. Therefore, the template was adapted for them with the following changes:

- Display double-weighted durations for activities with a Borg Scale of 15-20.
- Additional graphs: Two graphs were added, an effort graph and a steps graph.
- 'Week by Week' filter: A 'Week by Week' option was added in the time period filter, where the data appears grouped by week, thus allowing staff to track the weekly evolution of the 8-10 weeks program.
- Weekly duration progress bar: tracks the total duration of activities on a Borg Scale of 12 to 16, and fills up when it reaches 150 min, because one of the aims of their cardiac rehabilitation program is for the patients to do between 150 and 300 min of physical activity at this intensity per week.
- Custom activity types: in the exercise type drop-down, the following options were set: walking, cycling (outdoors), exercise bike, running, swimming, circuit exercise, dancing, gardening, and other.
- Specific information documents: documents specific to their cardiac rehabilitation program were added to the information pages.

Images of the pages showing these custom features in the East Galway Roscommon Integrated Care Hub website version are available in Section 12.3.2. (Website description of the East Galway Roscommon Integrated Care Hub version) of Annex C.

5.3. Creation of the Implementation and Customization Manual

To demonstrate how to implement and customize the website, an **Implementation and Customization Manual** has been created (see Annex F). The manual is designed as a learning-by-doing tool [45] and has three sections and an annex. The first section is intended for health professionals who are not familiar with the physical rehabilitation website, and it explains how the website works. The second section of the Tutorial provides step-by-step instructions on how to install the website, create users and verify its functionality. The third section provides two examples: the first explains how to make minor modifications to the website template to adapt it to their specific interest and application, and the second example addresses healthcare professionals who wish to use the website template to create a home monitoring website for a completely different application in any field of nursing, physiotherapy, and medicine, using the example of creating a website for general health monitoring. Figure 8 and Figure 9 present the customized 'Enter data' and 'My track' pages, respectively, developed following the second example. Finally, the annex of the manual includes several customization guides and instructions for long-term website management, such as how to create new users, remove user information for patients that are no longer participating in the program, etc.

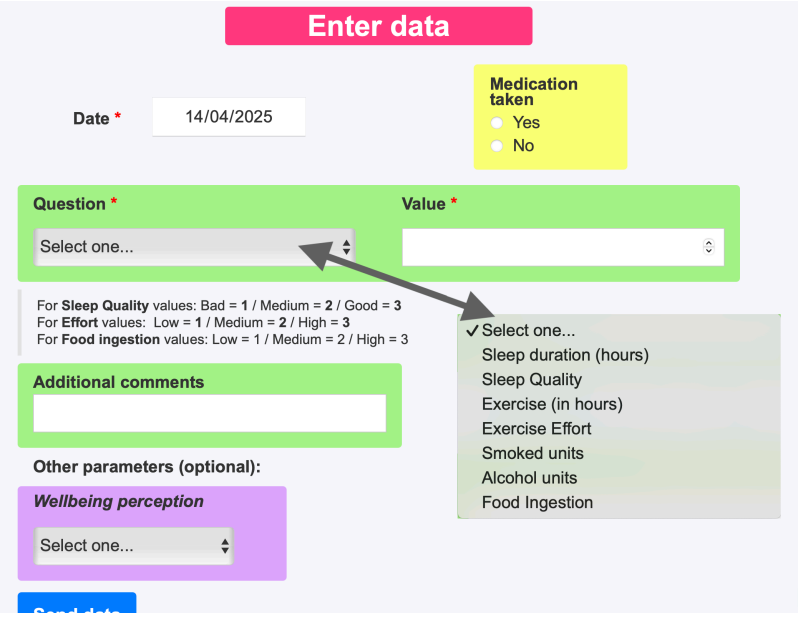

Figure 8. Patient's customized 'Enter data' page, developed following the second example from the Implementation and Customization Manual. Own creation.

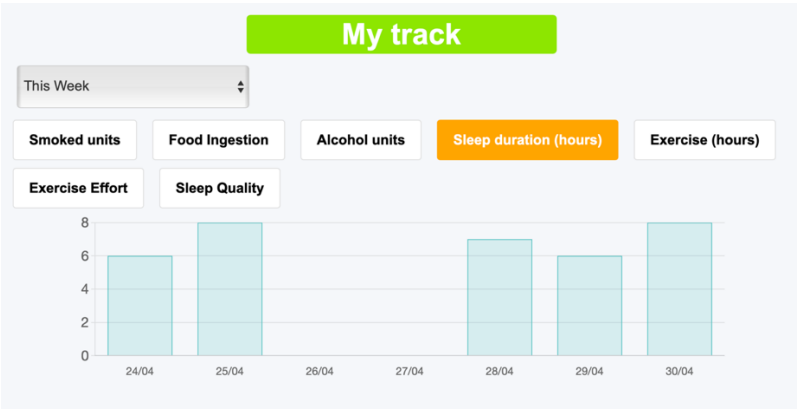

Figure 9. Patient's customized 'My track' page, developed following the second example from the Implementation and Customization Manual. Own creation.

Before developing the manual, extensive work was done to adapt the website code to ensure it could support all the changes described in the manual while maintaining functionality.

This manual is one of the most relevant deliverables of this project, and has been developed in a very detailed way to ensure that healthcare professionals with no experience in website development can implement and customize the solution.

5.4. Tests performed

The usability and reliability of the prototype website were tested by using simulated patients and healthcare staff. Each simulated patient used the website to enter data on their daily rehabilitation exercises, and professionals playing the role of healthcare staff tracked the process. The test involved more than 2.000 transferred data and messages. At the end of the trial, all professionals involved checked for any issues and verified that all patient exercise data downloaded from the website was completely accurate and easily usable.

In summary, the test on the simulated patients and professionals showed that both the patient and healthcare staff pages are clear and user friendly, and no errors were found in the downloaded data compared to the data entered in the rehabilitation diaries.

Additionally, it was verified that the website was compatible with the most widely used internet browsers (Google Chrome, Safari, Microsoft Edge, Mozilla Firefox, and Opera) [46].

Lastly, throughout the development of the 'Implementation and Customization Manual', some sections of the tutorial were tested with naïve users, and improvements were made based on their feedback, ensuring that the manual was clear and easy to follow.

5.5. Scientific dissemination of the platform created

To promote its use and potential applications, a scientific article was written detailing the website functionalities, design process, implementation and customization manual, and testing results. The aim of the article is to share it so that other professionals in the healthcare fields can adapt it for their own contexts.

The article has been submitted to different peer-reviewed journals in the fields of cardiovascular care and nursing. While it is being reviewed for publication, the full manuscript has been made publicly available as a preprint:

> Sabala, A., Mcbrearty, D., Salama, R., Farre, R., Loughnane, A., Otero, J., Farré, N. (2025). *Open-Source Customizable Website to Follow-Up Physical Rehabilitation of Cardiovascular Patients at Home*. Preprints.org. https://www.preprints.org/manuscript/202505.1703/v1

A copy of the preprint can also be found in Annex D of this project.

6. Execution schedule

This section focuses on the planning of the project execution schedule over time, including the definition of the phases and milestones, the work packages and their tasks, as well as the creation of different planning diagrams.

6.1. Phases and milestones

The project is structured into five main phases: the requirements analysis and system design (October 2024 - November 2024), the development and testing of the platform (November 2024-March 2025), the creation of the manual (April 2025 – May 2025), the writing of the scientific publication (April 2025 – May 2025), and project management and closure (ongoing for the entire duration of the project, final review in June 2025). As for milestones, there are three key milestones: the completion of the development of the platform (end of March 2025), the finalisation of the manual (early May 2025) and the online publication of a scientific article preprint (by May 2025).

6.2. Work breakdown structure (WBS)

The Work Breakdown Structure (WBS) is a system used in project management to decompose the work of a project, and is usually represented in a tree structure. In this project, the WBS is organized into five main phases, each comprising several work packages and associated tasks. Figure 10 shows the diagram of the WBS. The details of each task, such as the description, associated deliverables and estimated durations can be found in Table 11 of Annex E (Execution schedule details).

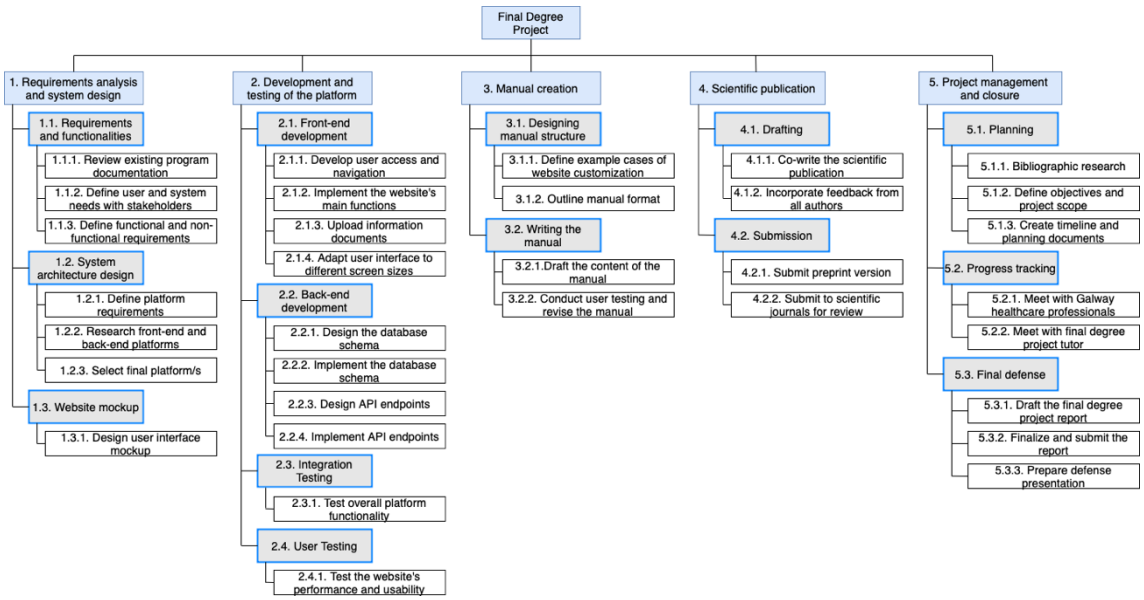

Figure 10. WBS diagram of the project. Own creation.

6.3. Precedence analysis and PERT-CPM diagram

Once all the tasks were defined, a precedence analysis was performed, as shown in Table 3. This table shows the task (or tasks) that precede each project task.

Table 3. Precedence analysis of the project's tasks

ID	Task	Precedent task
1.1.1.	Review existing program documentation	-
1.1.2.	Define user and system needs with stakeholders	1.1.1.
1.1.3.	Define functional and non-functional requirements	1.1.2.
1.2.1.	Define platform requirements	1.1.3.
1.2.2.	Research front-end and back-end platforms	1.2.1.
1.2.3.	Select final platform/s	1.2.2.
1.3.1.	Design user interface mockup	1.1.3.
2.1.1.	Develop user access and navigation	1.2.3., 1.3.1., 5.1.3.
2.1.2.	Implement the website's main functions	2.1.1.
2.1.3.	Upload information documents	2.1.1.
2.1.4.	Adapt user interface to different screen sizes	2.1.2., 2.1.3.
2.2.1.	Design the database schema	1.1.3.
2.2.2.	Implement the database schema	2.2.1.
2.2.3.	Design API endpoints	2.2.1.
2.2.4.	Implement API endpoints	2.2.2., 2.2.3.
2.3.1.	Test overall platform functionality	2.1.4., 2.2.4.
2.4.1.	Test the website's performance and usability	2.3.1.
3.1.1.	Define example cases of website customization	2.4.1., 5.2.2.
3.1.2.	Outline manual format	2.4.1.
3.2.1.	Draft the content of the manual	3.1.1., 3.1.2.
3.2.2.	Conduct user testing and revise manual	3.2.1
4.1.1.	Co-write the scientific publication	3.2.2.
4.1.2.	Incorporate feedback from all authors	4.1.1.
4.2.1.	Submit preprint version	4.1.2.
4.2.2.	Submit to scientific journals for review	4.2.1.
5.1.1.	Bibliographic research	1.1.1
5.1.2.	Define objectives and project scope	5.1.1.
5.1.3.	Create timeline and planning documents	5.1.2.
5.2.1.	Meet with Galway healthcare professionals	2.1.2., 2.3.1.
5.2.2.	Meet with final degree project tutor	1.1.1
5.3.1.	Draft the final degree project report	4.2.2., 5.2.1.
5.3.2.	Finalize and submit the report	5.3.1.
5.3.3.	Prepare defense presentation	5.3.2.

Following the precedence analysis, a Program Evaluation Review Technique (PERT) diagram was created, which is a visual tool used to make visible the dependencies identified in the analysis. The Critical Path Method (CPM) was also applied within the diagram to find the critical path for on-time project completion. Figure 11 shows the PERT-CPM diagram of the project, with the critical path highlighted in red. In the diagram, the black arrows represent the flexible tasks, which can be delayed without affecting the project duration, and the red arrows represent the critical ones, which, if delayed, would delay the project duration. On the other hand, the dashed arrows symbolize fictitious activities. The PERT-CPM diagram makes it possible to determine the total project

duration, which in this case is 225 working days[10], and which activities should be prioritised in order to avoid delays. Lastly, each node shows the early start and late finish times for the task (or tasks) entering that node. All related calculations, including early start, late start, early start, late finish and slack time, can be found in Table 12 of Annex E (Execution schedule details). These calculations were also used for the creation of the GANTT chart diagram in the following section.

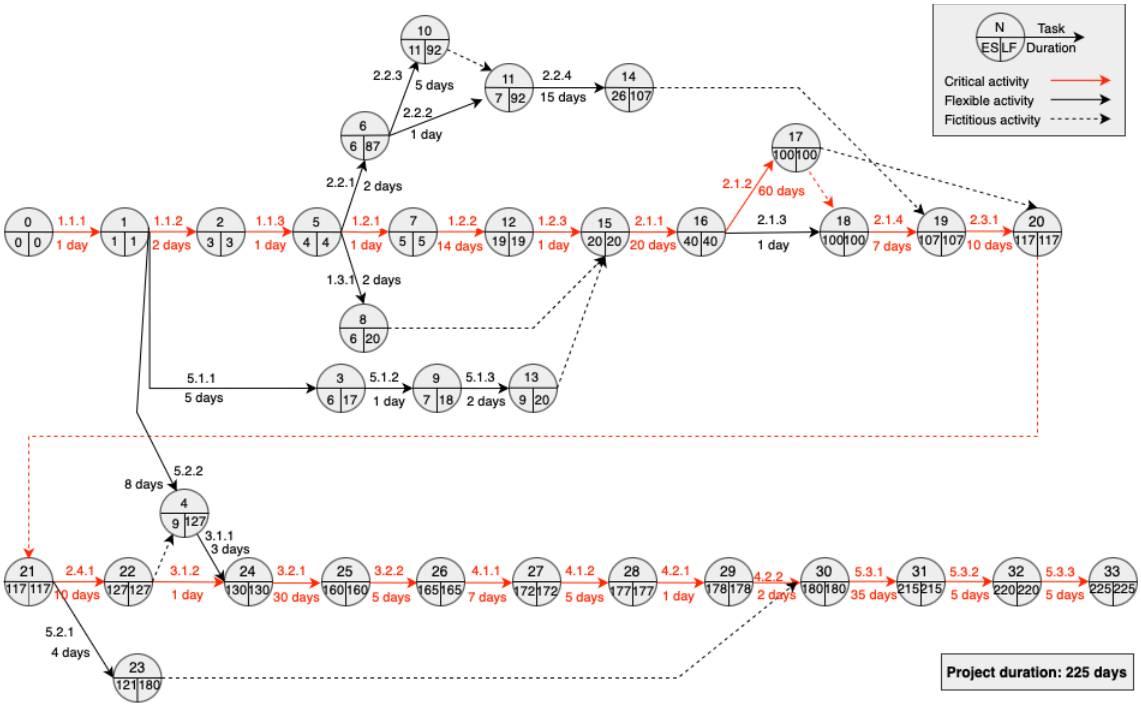

Figure 11. PERT-CPM diagram of the project tasks (split in two levels due to space limitations). The total project duration is 225 working days. Own creation.

6.4. GANTT diagram

A GANTT diagram is a type of chart that displays the tasks that must be completed and when. As mentioned in the previous section, a GANTT chart of the project was created using the calculations detailed in Table 12 of Annex E (Execution schedule details). Figure 12 shows the diagram with the timeline for each task. In this figure, the critical tasks are represented in red, the non-critical tasks in blue, and their corresponding slack time in light blue.

[10] A working day is considered as 8 hours of work.

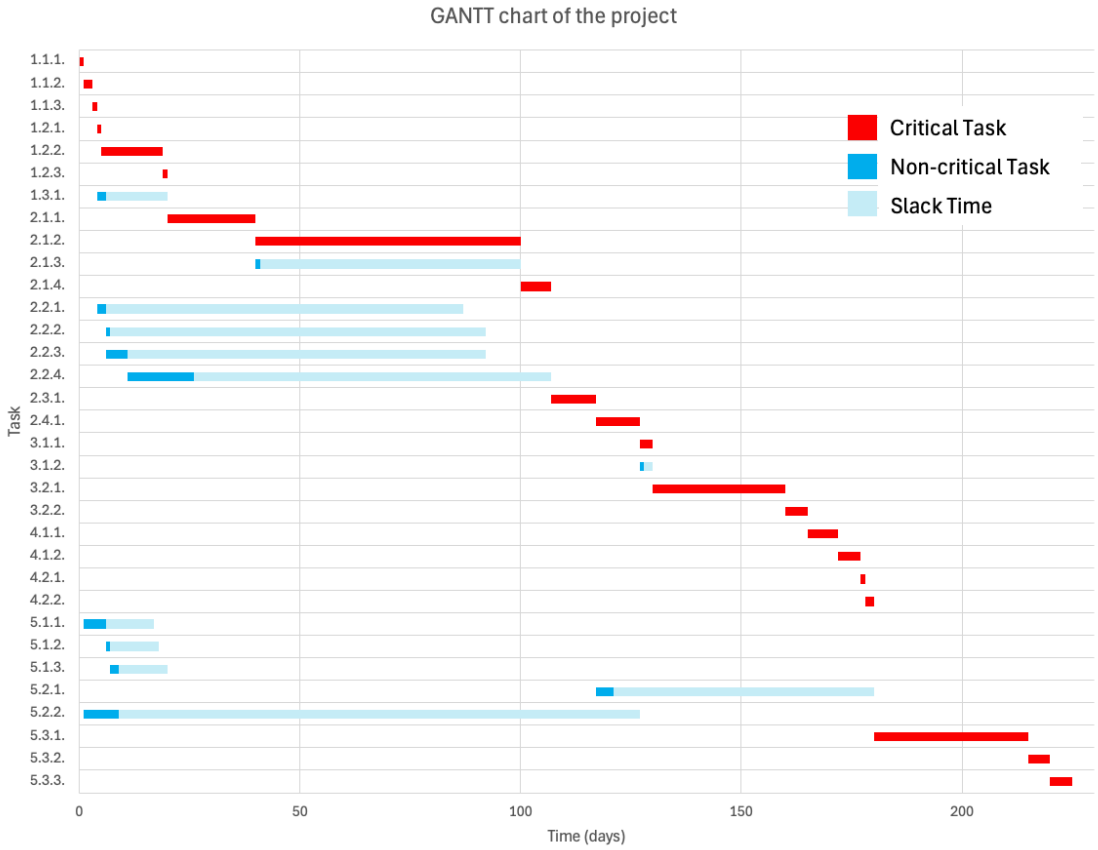

Figure 12. GANTT chart of the project. Own creation.

7. Technical feasibility

This section analyses whether the proposed solution can be successfully developed and implemented with the technical resources, technology, and skills available. The required technologies for this project are Webflow, which is used for frontend design, website functionalities, and hosting, and Xano, which provides backend services and API management.

Although there is no previous experience with Webflow or Xano, there is a strong background in SQL, app, and website development, along with good coding skills across multiple languages. Additionally, there is a strong analytical capacity for problem-solving. Nevertheless, knowledge of APIs and website security is limited. Luckily, nowadays there is access to many online tutorials and several online learning resources, which have made it possible to expand knowledge in these fields. The project has also benefited from a paid Webflow subscription plan, as well as the responsive customer service that both Webflow and Xano offer, which has been highly useful in supporting problem-solving throughout the development of the project.

The regular support and guidance from the tutor of the project has been key in organizing the project, ensuring the objectives were met, and helping structure the 'Implementation and Customization Manual' to ensure clarity and ideate example cases. The tutor, the project director, and the other co-writers have also contributed with their expertise to the joint writing of the scientific preprint paper related to the project. Furthermore, the feedback from Galway health professionals has been very valuable in understanding the user experience and context of the project, as well as key needs.

This project is part of a formative project supported by a scholarship of Fundació Bosch i Gimpera, which has provided funding to cover the necessary subscription fees. This financial backing has made it possible to deliver a quality and scalable solution.

Despite these strengths, the project has some risks and limitations. Although the implementation and customization manual is very detailed, it may overwhelm some users or cause some of them to feel stuck or hesitant to seek help if difficulties arise. There may also be reluctance on the healthcare professionals wanting to try to implement the solution due to subscription costs. However, the main limitation of this project is the dependency on platforms (Webflow and Xano), which could implement changes that leave parts of the manual obsolete over time.

Finally, while web security measures have been established, it is necessary to continuously evaluate and improve these protections to ensure the ongoing security of the platform.

7.1. SWOT analysis of the proposed solution

The following table (Table 4) presents the SWOT analysis of the proposed solution.

Table 4. SWOT analysis table of the proposed solution

Strengths	**Weaknesses**
- Strong background in coding - Solid analytical and problem-solving skills - Paid access to Webflow - Availability of multiple online learning resources - Responsive customer support from both Webflow and Xano - Ongoing support and feedback from tutor, director and healthcare professionals	- No prior experience with Webflow and Xano - Limited knowledge of APIs and security practices - The solution lacks integration and interoperability with EHR systems. - The implementation and customization manual may be too detailed or complex for some users. - Usability and effectiveness of the manual have not yet been fully validated.
Opportunities	**Threats**
- Ability to rapidly learn no-code tools - Ability to understand and manage the frontend and backend logic - Potential to help healthcare professionals monitor their patients - Expansion of features through combining the two platforms (Webflow and Xano) - Continuous improvement of security practices over time	- Reticence to adopt due to costs - Implementation challenges for professionals with limited tech knowledge - Dependency on third-party platforms (Webflow and Xano) - Lack of real-time support if users encounter issues with the manual.

8. Economic feasibility

This section contains the preparation of a budget including all costs associated with the project and temporal assessment of the corresponding payments.

8.1. Project costs

The largest cost of the project is due to labour. According to the Gantt chart, the total duration of the project tasks is 225 days. Assuming an 8-hour workday, a total of 1.800 working hours is calculated. Then, considering that the average starting hourly wage for biomedical engineers in Spain is 12,70 €/h [47], the total labour cost is estimated at 22.860,00 €.

In terms of fixed costs for the development of the project, Webflow, the frontend and hosting platform, involved two distinct costs:

- Workspace subscription: The *Core* workspace plan was required to access to advanced development features such as site duplication or custom code editing in all sites [48]. This subscription was active for 8 months at 30 €/month, amounting to a total of 240 €.
- Site plan subscription: The *Basic* site plan was needed to enable unlimited form submissions initially [48]. Later, the form handling approach was modified, making the upgrade unnecessary when already disposing of a *Core* workspace plan. Thus, the plan was only used for 4 months, at 19,29 €/month, totalling 77,16 €.

On the other hand, the backend platform Xano was used under the *Build plan* (free of cost), which allows for a total of 100.000 database records [49], which is sufficient to meet the backend requirements of the project and did not involve any cost.

Later in the project, the website was cloned to the Galway Webflow and Xano accounts for implementation in the East Galway Roscommon Integrated Care Hub. For this purpose, an annual *Basic* Webflow site plan was purchased and covered by the organization.

This project is part of a formative project funded by a scholarship from *Fundació Bosch i Gimpera*, which covered all the costs associated with Webflow subscriptions and provided a monthly remuneration for 9 months. This enabled full focus on delivering a high-quality project without financial limitations.

The following table (Table 5) summarizes the project's costs.

Table 5. Summary of project costs

Concept	Function	Payer	Qty	Unit price	Total (€)
Estimated labor	Development of the project	Not covered fully	2.176 h	12,70 €/h	22.860,00 €
Webflow workspace subscription	Advanced development features	Fundació Bosch i Gimpera	8 months	30,00 €/ month	240,00 €
Webflow site plan subscription	Form submission	Fundació Bosch i Gimpera	4 months	19,29 €/ month	77,16 €

Webflow site plan subscription - Galway	Galway implementation of the website	East Galway Roscommon Integrated Care Hub	1 payment	179,39 €/year	179,39 €
Student scholarship	Partial labor compensation	Fundació Bosch i Gimpera	9 months	293,44 €/ month	2.640,96 €
Total					**25.997,51 €**

8.2. Table of payments of the project

All costs in Table 6 were paid monthly between October 2024 and June 2025 by Fundació Bosch i Gimpera, except for the annual Webflow site subscription for Galway, which was paid in March by the East Galway Roscommon Integrated Care Hub. The labor cost calculated in the previous section is an estimation and remains theoretical.

Table 6. Table of payments

Cost type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Webflow workspace subscription (30 €)	30 €	30 €	30 €	30 €	30 €	30 €	30 €	30 €	-	240,00 €
Webflow site plan subscription (19,29 €)	-	-	-	-	19,29 €	19,29 €	19,29 €	19,29 €	-	77,16 €
Webflow site plan subscription - Galway (annual)	-	-	-	-	-	179,39 €	-	-	-	179,39 €
Student scholarship (293,44 €)	293,44 €	293,44 €	293,44 €	293,44 €	293,44 €	293,44 €	293,44 €	293,44 €	293,44 €	2.640,96 €
Total per month	323,44 €	323,44 €	323,44 €	323,44 €	342,73 €	522,12 €	342,73 €	342,73 €	293,44 €	**3.137,51 €**

9. Regulations and legal aspects

9.1. Applicable Legislation

The cardiac rehabilitation platform must comply with Irish and European legislation, as it is intended for patients and healthcare professionals in Galway, Ireland. This section explores the main legal frameworks related to the implementation of the platform in Ireland, as well as the dissemination of the technology for use by other healthcare professionals.

9.1.1. General Data Protection Regulation (GDPR) – EU Regulation 2016/679

The General Data Protection Regulation (GDPR) [50] is a European regulation that applies to the processing of personal data in the European Union. According to Article 4(1) of the GDPR, 'personal data' means 'any information relating to an identified or identifiable natural person'. Thus, even if a system does not collect directly identifiable information, it may fall within the scope of the GDPR if data can be traced back to an individual. This is the case of this project's platform. Even though it does not store personal identifiers such as name, date of birth, or email address, each user will be assigned a randomly generated username. Healthcare professionals will save a file linking each patient with their username, password and identifier within the website, which can be stored locally (e.g. an Excel file or Word document saved locally on the computer) or even on a physical sheet of paper outside any computer. This makes the exercise data pseudonymised, but remains identifiable and falls within the scope of the GDPR.

In addition, the data collected through the platform, such as type and duration of exercise, perceived exertion (Borg scale) and dates of exercise, is considered health-related data under Article 9 of the GDPR. The legal basis for the processing of this data is provided by Article 9(2)(h) of the GDPR, which allows the processing of health data when it is:

"necessary for the purposes of preventive or occupational medicine, for the assessment of the working capacity of the employee, medical diagnosis, the provision of health or social care or treatment or the management of health or social care systems and services on the basis of Union or Member State law or pursuant to contract with a health professional and subject to the conditions and safeguards referred to in paragraph 3." [51]

In this project:

- The platform is part of a supervised cardiac rehabilitation program provided by healthcare professionals.
- The data is processed under the responsibility of professionals subject to medical confidentiality (e.g., physiotherapists, nurses, or doctors).
- The link between the username and the actual patient is made outside the platform.

In this context, under Article 9(2), explicit consent is not strictly required, as the processing falls within a legal medical context. However, it is still best practice to inform patients of how their data is processed and appropriate documentation, such as privacy notices and informed participation forms.

9.1.2. Irish Data Protection Act 2018

The Irish Data Protection Act 2018 [52] applies directly in Ireland and complements the GDPR in areas where member states of the European Union have some flexibility. It also established the Data Protection Commission as the national data protection authority. Therefore, this legislation applies to implementation of the cardiac rehabilitation website in Galway, to ensure personal data is processed in a lawful and transparent manner and retained only for specified and legitimate purposes.

9.1.3. Copyright and Open-Source Licensing Law

As this project includes a publicly available frontend, backend and manual, it is subject to intellectual property and licensing laws.

The frontend has been made available to clone in the 'Made in Webflow' section of Webflow, which implies that it is made available under a CC0 public domain dedication (Creative Commons) [53]. Similarly, the backend shared through the 'Snippets' function in Xano is also subject to CC0. This allows anyone to copy, adapt, share and use the materials.

As for the manual made available online as a preprint, it is under the CC BY 4.0 license, which allows distribution and reuse if the author/s are cited [54].

9.1.4. Other considerations

Although not a legislation, the 'Digital for Care: A Digital Health Framework for Ireland 2024-2030' [55], a recently released national strategy, supports the use of digital tools to improve health services. Therefore, it reflects the Irish government priorities to support projects like this one, which aims to make cardiac rehabilitation more accessible to patients.

Additionally, the Medical Device Regulation (MDR) [56] does not apply to this platform as it does not diagnose, treat or monitor any medical conditions, it only tracks exercise data, and it does not analyse it.

9.2. Compliance and Requirements

To ensure compliance with the relevant legislation mentioned before, the following conditions must be met:

- Only data strictly necessary for monitoring purposes should be collected on the website.
- Website usernames must be pseudo-anonymous and randomly generated.
- Strict access controls and complex passwords should be implemented to ensure data security.
- The program must be supervised by qualified healthcare professionals
- Exercise data should only be stored online while the patient is participating in the program, and deleted when no longer needed, unless the patient approves the processing of their data for other purposes.

9.3. Potential Legal issues

Despite the platform's protections, some legal risks may arise. For example, even though data is pseudo-anonymised, there is a risk of linking a username or platform ID number to the patient's identity if the record is not stored in a secure manner.

Furthermore, if patients are not properly informed about how their data will be stored and processed and what it will be used for, this risks breaching the transparency obligations of the GDPR.

Finally, if the platform is adopted in a country other than Ireland or outside the European Union, different laws may apply to the platform and should be reviewed to ensure compliance prior to use.

10. Conclusions and future lines of work

The development of this project involved the design, implementation and evaluation of a flexible, low-cost, open-source telemedicine platform focused on exercise monitoring in cardiac rehabilitation. The goal was to address a limitation of current telemedicine solutions: the lack of customizable platforms to adapt to specific rehabilitation monitoring needs. Most of the tools currently available are generic and offer little flexibility, making them difficult to adopt in clinical practice. To overcome this gap, the project aimed to create a website that could be easily implemented by healthcare professionals with no experience in website development, and customized to suit different exercise rehabilitation protocols or monitoring needs.

The main objectives of the project included the development of an exercise monitoring website for the East Galway Roscommon Integrated Care Hub, the creation of a comprehensive implementation and customization manual, and the dissemination of the results. These goals were successfully achieved. The final product is a web-based platform that allows patients to submit their daily exercise data (e.g., date, exercise type, duration, and intensity) and to view their progress through interactive graphs. Healthcare professionals can also access this information to track the patients' progress, send messages, and export the data in a spreadsheet format for further analysis.

The platform was developed using Webflow for the frontend and Xano for the backend and API management. These tools were chosen for their clonability features, to ensure an easy implementation by healthcare professionals with minimal technical background. Fundació Bosch i Gimpera provided financial support that allowed the purchase of the necessary subscriptions. Additionally, the project received guidance and feedback from supervisors and healthcare professionals in Galway, which was crucial in structuring the manual, improving the user interface, and ensuring the website addressed real clinical needs.

Another key outcome of the project is the implementation and customization manual, conceived as a learning-by-doing tool. This manual offers step-by-step instructions on how to implement the website as-is, as well as two examples on how to customize it. The first example proposes an adaptation with minor changes, and the second one a customization for a completely different application. Making this website customizable and creating the manual has been one of the main challenges of the project, as the necessary functions had to be developed in a way that is easy to implement and customize for non-technical users. Although great effort has been made to ensure the clarity of the manual, there is a risk that users may hesitate to adopt the tool if they encounter difficulties during implementation or lack immediate support.

Another limitation of the project is the dependence on third-party platforms, Webflow and Xano. Although these tools enabled the development of the platform, a major update or changes to the platforms could leave parts of the manual obsolete. Additionally, although security practices were implemented, ongoing evaluation is required to ensure long-term platform security and compliance with data protection regulations.

Despite these limitations, the results of the project are very promising. Usability tests with simulated patients and healthcare professionals demonstrated that the website is intuitive and functional, with

more than 2,000 data entries and messages transferred during the trial period without errors. Additionally, the platform was verified to be compatible with major web browsers, enhancing its accessibility.

Additionally, the main advantages of the developed tool are its adaptability and low cost. Its adaptability makes it a very promising tool for various monitoring contexts and rehabilitation programs, and its affordability makes it appropriate for low-resource settings where financial constraints can limit access to telemedicine platforms. Furthermore, by providing this platform, the project contributes to the adoption of telemedicine solutions, which are associated with many benefits, such as improved access to healthcare.

Looking ahead, the next step is to use the platform with real clinical patients in Galway, which will soon be done. This will provide insights into its real-world usability, effectiveness and impact on user adherence. In the future, it would be beneficial to conduct a complete usability testing of the implementation and customization manuals with naïve users, to identify areas of the manual that need changes or additional support. Additionally, future improvements could include the creation of short tutorial videos, or the development of a user support community to address questions of healthcare professionals wanting to implement the website.

Overall, this project presents a customizable telemedicine tool that addresses real clinical needs in cardiac rehabilitation. By making the platform frontend and backend available to clone online, it provides healthcare professionals around the world the ability to implement and adapt the system, thus contributing to a more personalized and accessible care for patients.

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12. Annexes

This section contains the additional documents referenced throughout the project report.

12.1. Annex A: Mockup website design

This annex includes different images showing the outline of the website design.

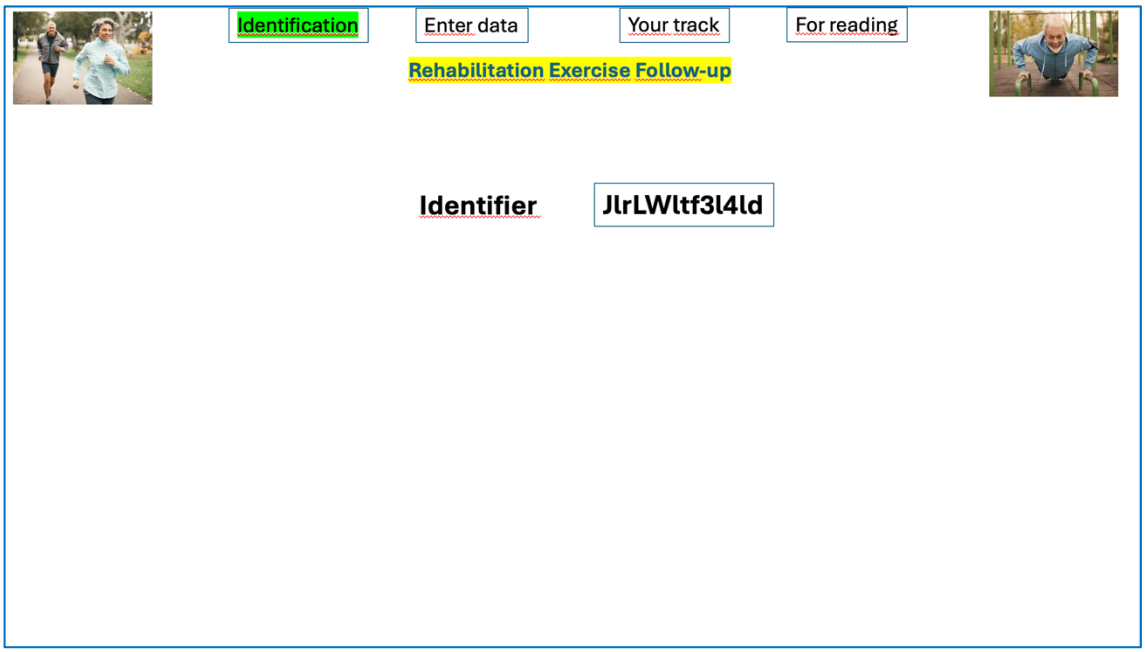

Figure 13. Design of the website identification page. Created by Núria Farré, project director.

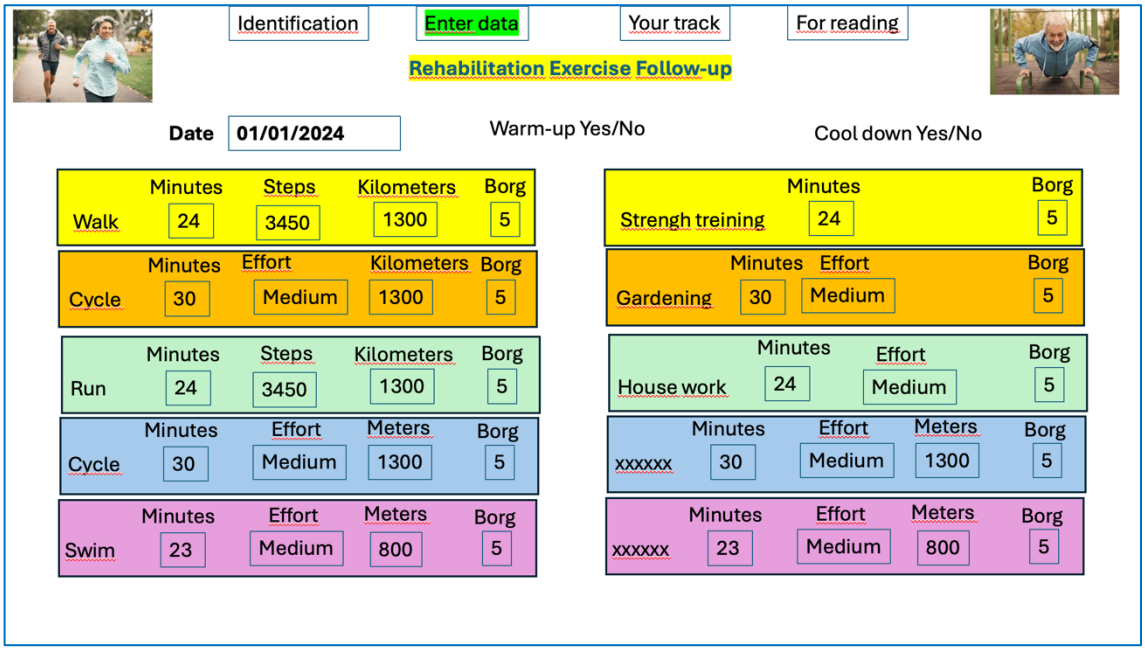

Figure 14. Design of the website 'Enter data' page. Created by Núria Farré, project director.

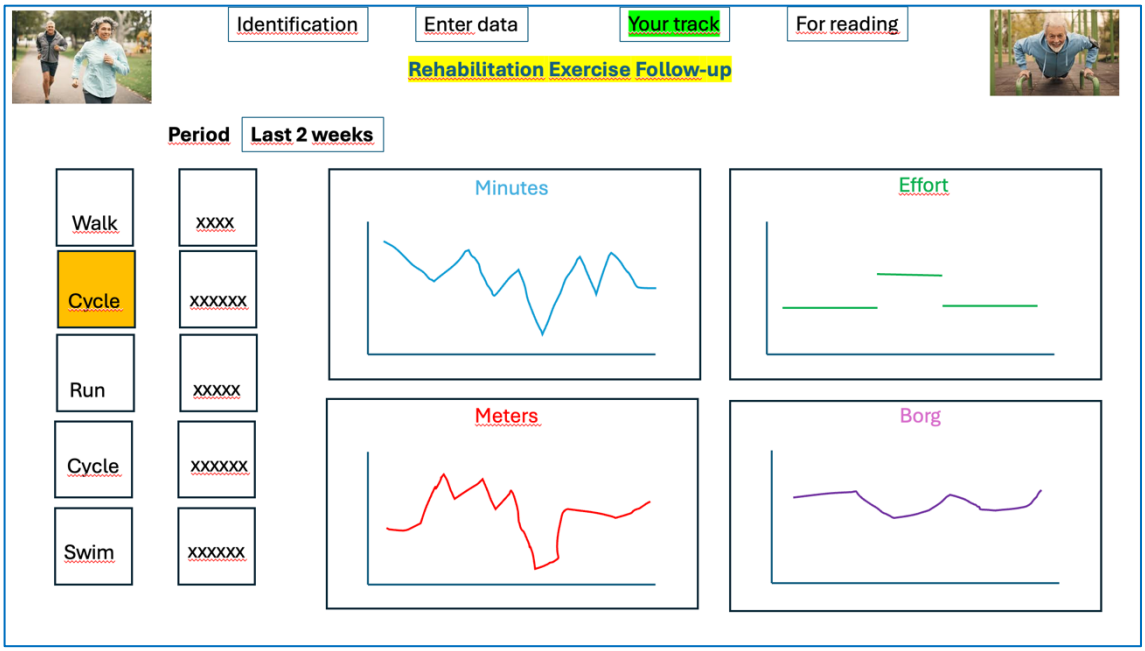

Figure 15. Design of the website 'Your track' page. Created by Núria Farré, project director.

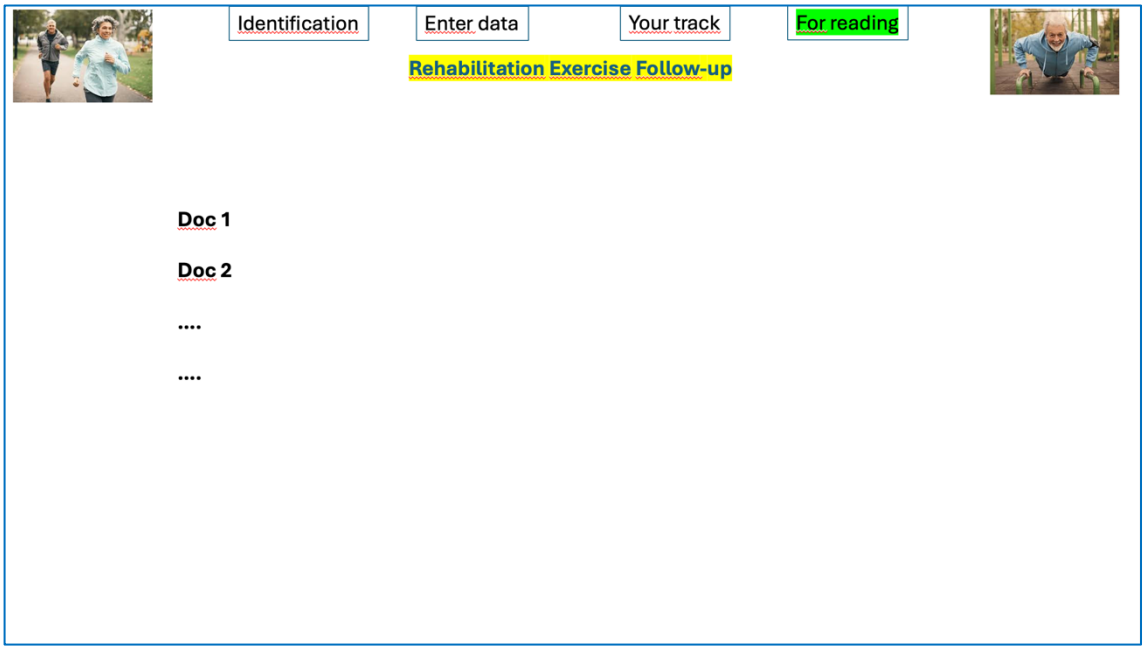

Figure 16. Design of the website 'For reading' page. Created by Núria Farré, project director.

12.2. Annex B: Database structure and API endpoints

The database structure and API endpoints developed in Xano are detailed in this annex.

12.2.1. Database table structures

This section provides a detailed description of three tables that make up the backend database: the 'user' table, the 'data_entries' table, and the 'messages' table.

Users table

Table 7. Structure of the 'user' table

Field name	Data type	Constraints	Description
'id'	Integer	Primary key, autogenerated	Unique identifier for each user.
'created_at'	Timestamp	Autogenerated	Date and time when the user record was created.
'username'	Text	Required	Unique username for the user
'password'	Text	Required	Password used for authentication. Stored securely (hashed); appears masked in the interface.
'group'	Integer	Required	User role: '0' for patient, '1' for healthcare professional

Exercise data table

Table 8. Structure of the 'data_entries' table

Field name	Data type	Constraints	Description
'id'	Integer	Primary key, autogenerated	Unique identifier for each data entry.
'created_at'	Timestamp	Autogenerated	Date and time when the entry was created.
'Identification'	Integer	Required, foreign key to *users.id*	User that created the entry.
'Date'	Date	Required	Date when the activity was performed.
'WarmUp'	Text	Optional	Whether the user performed a warm-up.
'ExerciseType'	Text	Required	Type of exercise performed.
'Other_activity'	Text	Optional	Description if 'ExerciseType' is set to 'Other'.
'Duration'	Integer	Required	Duration of the exercise in minutes.
'BorgScale'	Integer	Required	Perceived exertion on the Borg Scale.
'Steps'	Integer	Optional	Number of steps recorded.
'Effort'	Integer	Optional	Perceived effort level.

‘Distance’	Integer	Optional	Distance covered during the exercise.
‘Units’	Text	Optional	Unit of measurement for distance-
‘CoolDown’	Text	Optional	Whether the user performed a cool-down.

Messages table

Table 9. Structure of the ‘messages’ table

Field name	Data type	Constraints	Description
‘id’	Integer	Primary key, autogenerated	Unique identifier for each message.
‘created_at’	Timestamp	Autogenerated	Date and time when the message record was created.
‘sender_id’	Integer	Required, foreign key to *users.id*	ID of the user who sent the message.
‘receiver_id’	Integer	Optional, foreign key to *users.id*	ID of the message recipient. If empty, the message is addressed to staff.
‘message_content’	Text	Required	Text content of the message.
‘timestamp’	Timestamp	Required	Date and time of message sent.

12.2.2. API endpoints

This section provides a summary of the API endpoints developed for backend communication between the database and the frontend.

Table 10. Summary of the API endpoints developed for the application, including their methods, access requirements, and purpose.

Endpoint	Method	Authentication required	Accessible by	Description
/auth/login	POST	No	All users	Authenticates a user using username and password. If valid, returns a token valid for 24 hours.
/auth/me	GET	Yes	All authenticated users	Returns the role (group) of the authenticated user.
/data_entries	GET	Yes	Patients, staff	Staff users retrieve all exercise records. Patients retrieve only their own.
/data_entries	POST	Yes	Patients	Allows patients to submit a new exercise entry via JSON payload.

/messages	POST	Yes	Patients, staff	Adds a new message entry from the authenticated user to a receiver.
/messages	GET	Yes	Patients, staff	Staff users retrieve all messages. Patients retrieve only their own sent and received messages.

12.3. Annex C: Website interface and functionality overview

This annex provides a detailed description of the website template and the East Galway Roscommon Integrated Care Hub version, including the main features and navigation flow for both patients and healthcare staff.

12.3.1. Website template description

The entry point of the template website is the login page (Figure 17). Through this page, users are authenticated and then redirected to the patient's interface, if they are patients, or to the healthcare professionals' interface, if they are staff members.

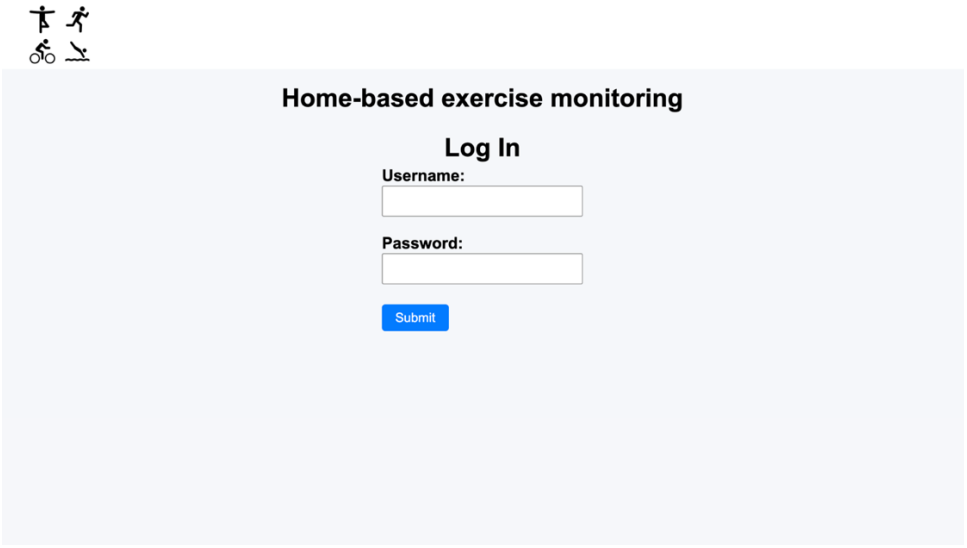

Figure 17. Login page - Website template. Own creation.

Patient's interface

When a patient logs in, it is directed to the patient's home webpage (Figure 18), where the messages interchanged with the healthcare staff can be seen, and the patient can send messages to the healthcare staff.

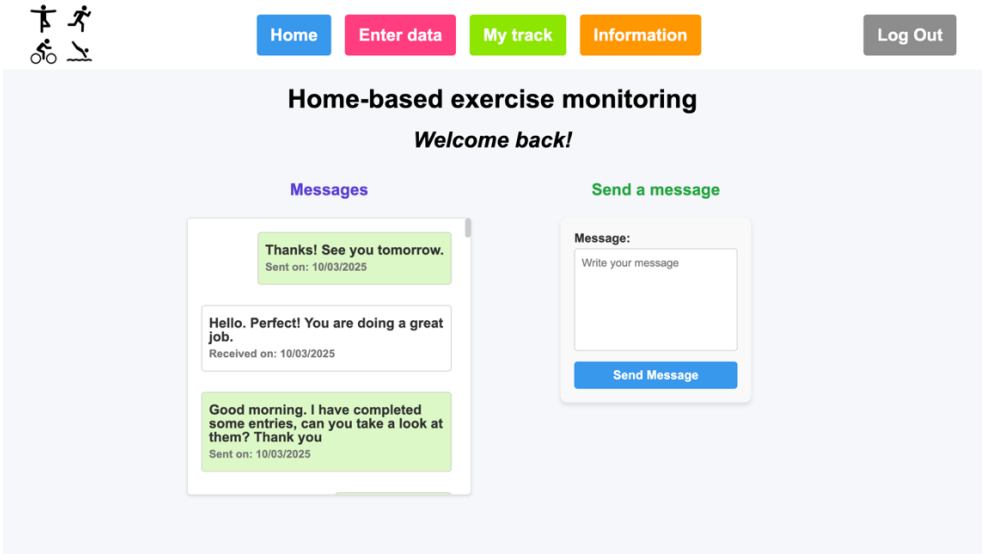

Figure 18. Patient's home page - Website template. Own creation.

Then, using the menu on the top of the page the patient can go to ‘Enter data’, ‘My track’ and ‘Information’ pages, as well as log out. At the ‘Enter data’ page (Figure 19), the patient can complete the physical activity diary. The user can select a date, which is useful in case of reporting data of rehabilitation exercises from previous days). The exercise type can also be selected, and, if the patient has done an exercise type that is not included in the list, the ‘Other’ option can be selected and a free text field will appear to specify it. Additionally, if a patient has exercised more than once one day, more entries can be made for that same day with the details of each physical activity.

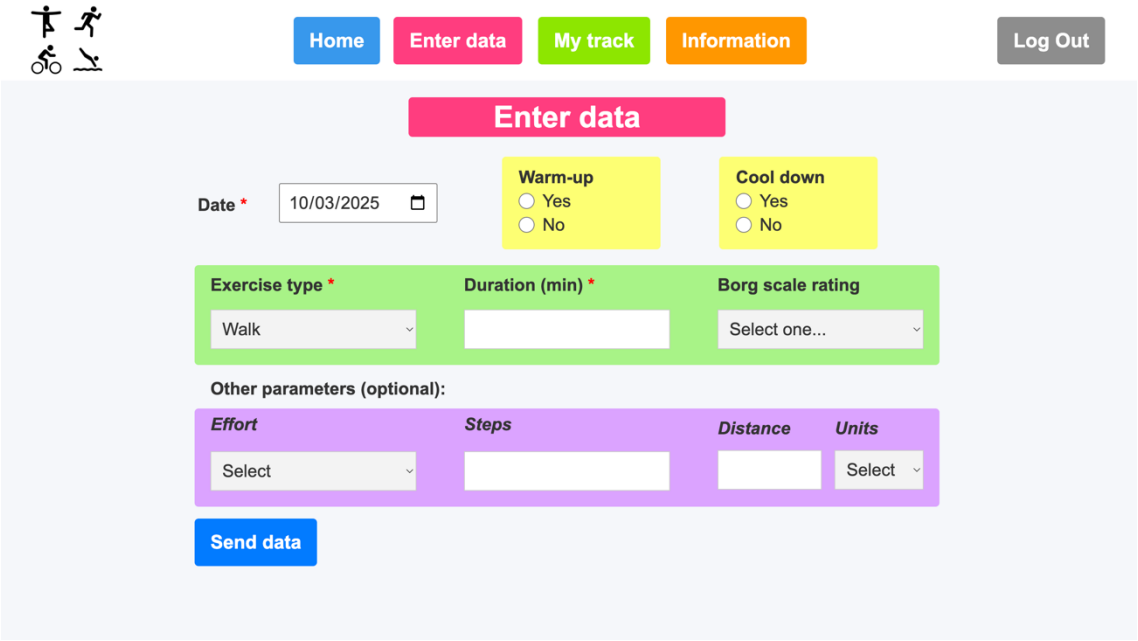

Figure 19. Patient's 'Enter data' page – Website template. Own creation.

By clicking the ‘My track’ button in the top menu, the patient can see the time evolution of their exercises (Figure 20). Also, users can choose which exercise to see graphically and on which time scale.

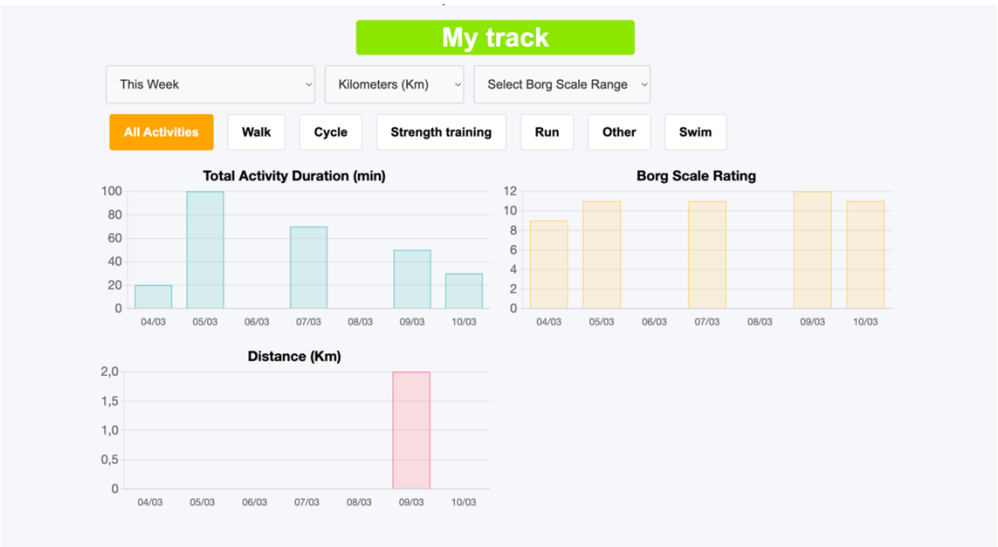

Figure 20. Patient's 'My track' page – Website template. Own creation.

Then, at the ‘Information’ page (Figure 21), the patient can download the website user instructions and any written or video information that the rehabilitation program has made available to them.

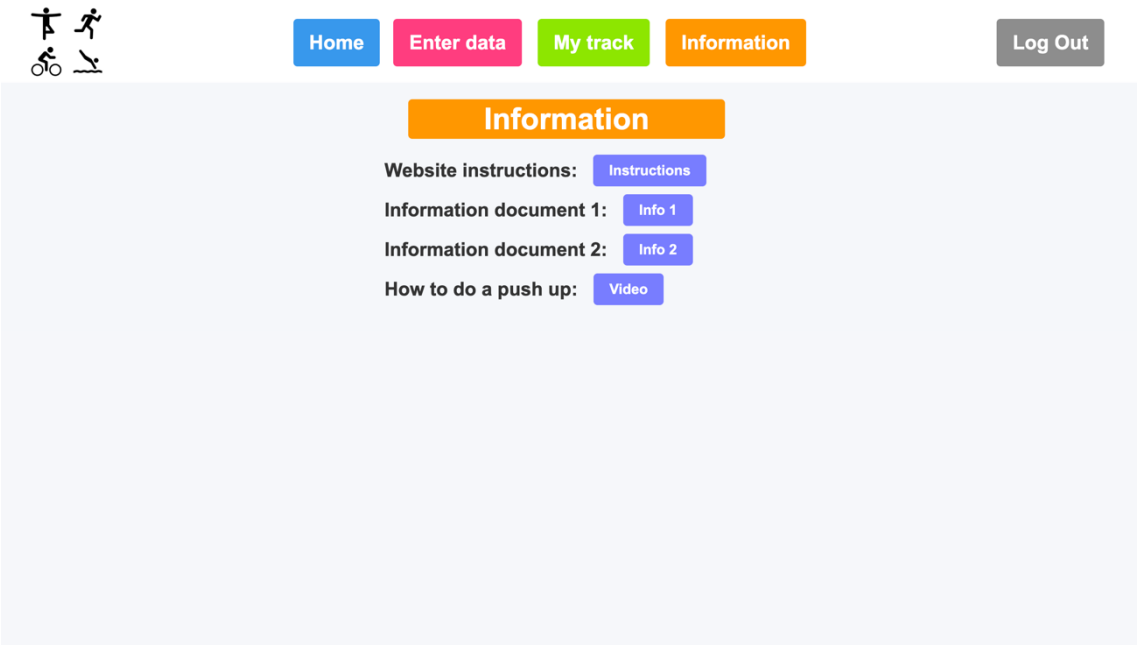

Figure 21. Patient's 'Information' page. Own creation.

By clicking at the ‘Log Out’ button on the top-right of any page, the user will be logged out of the website and redirected to the entry point, the login page.

Healthcare staff’s interface

Users who are part of the healthcare staff, will be directed to the staff’s home page (Figure 22). There, the most recent messages interchanged with patients can be seen (either all of them or filtered by patient). Also, messages can be sent by filling the ‘Send a message’ box with the patient’s ID and the message.

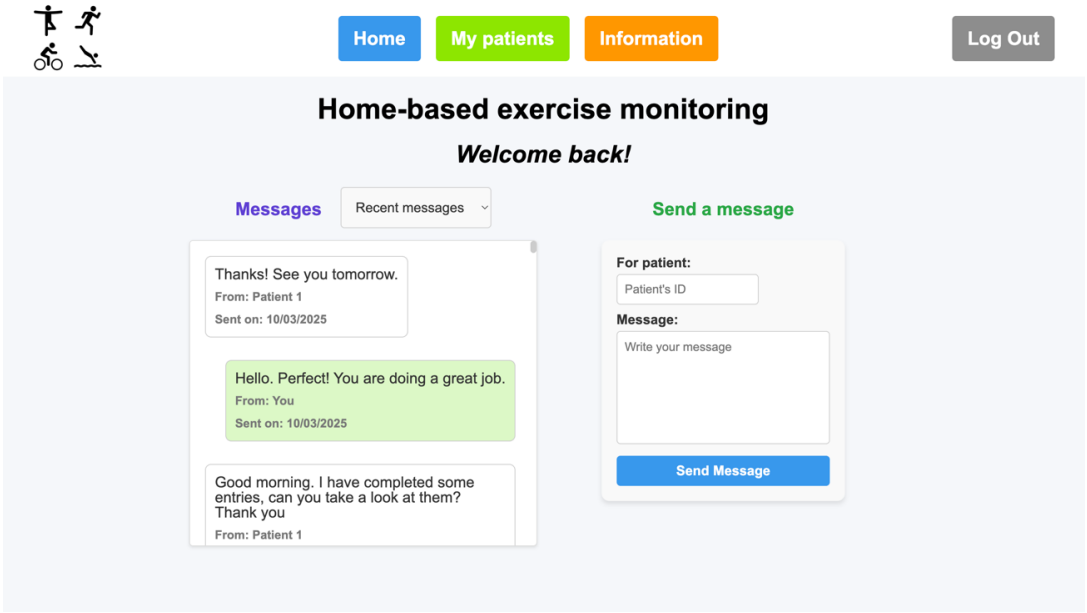

Figure 22. Healthcare staff's home page - Website template. Own creation.

Through the menu on the top of the page, the staff user can go to ‘My patients’ or ‘Information’ pages, as well as log out. At the ‘My patients’ page (Figure 23), the user can browse and select among all the patients included in the home care program to see a graphical display of the time evolution of the patient’s activities. In addition, the buttons below the graphs allow the professional to send a message to the patient (redirecting to the ‘Home’ page), to download the data corresponding to the graphs in an Excel format (‘Download data for these filters’ button), or to download all the data from all the patient (‘Download data of all patients’ button), so that any analysis tool can be used to further process the data.

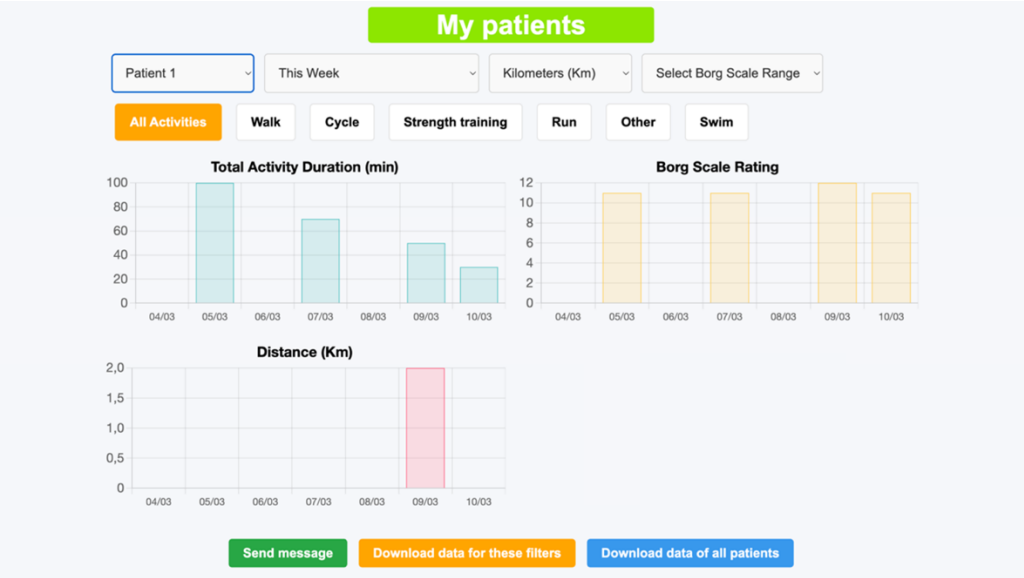

Figure 23. Healthcare staff's 'My patients' page. Own creation.

Lastly, the staff interface also has an ‘Information’ page (Figure 24) where the user can download the website instructions for staff and any other information that has been made available. Also, at any page the staff can log out by clicking at the ‘Log Out’ button at the top-right of the page.

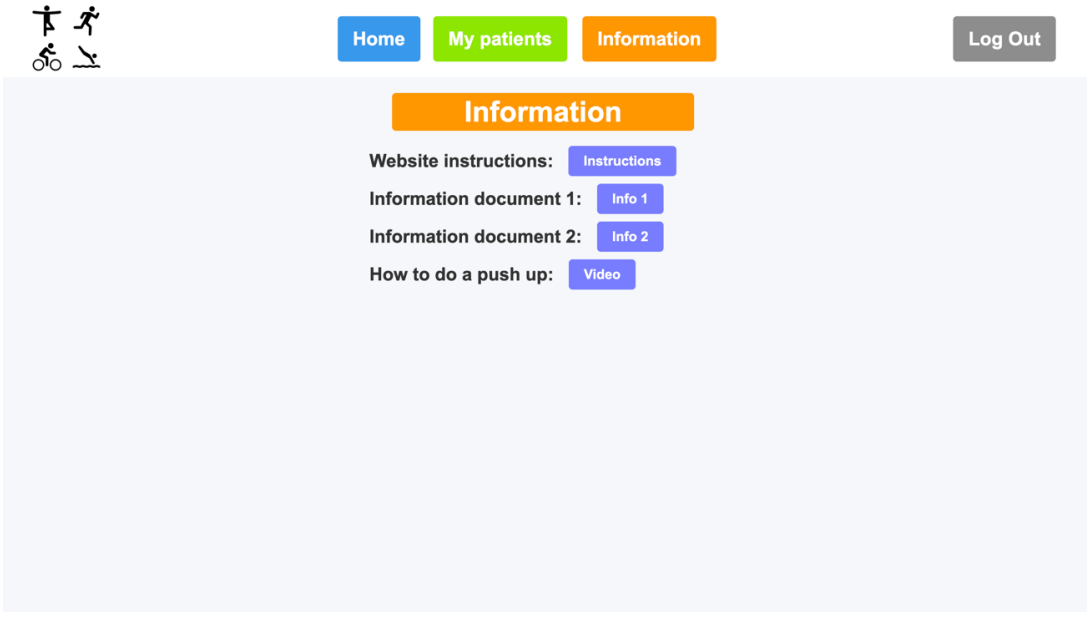

Figure 24. Healthcare staff's 'Information' page - Website template. Own creation.

12.3.2. Website description of the East Galway Roscommon Integrated Care Hub version

The East Galway Roscommon Integrated Care Hub version of the website has the structure described in Section 12.3.1. (Website template description), but includes several additional features tailored to the needs of their cardiac rehabilitation program.

Figure 25 shows the 'My Track' page (patients' view), which includes the following changes:

- Additional graphs: an effort graph and a steps graph
- A weekly duration progress bar, to track the total duration of activities during the current week at a Borg Scale of 12 to 16
- A 'Week by week' option in the time period filter
- Double-weighted durations for activities rated 15-20 on the Borg Scale
- Custom activity types

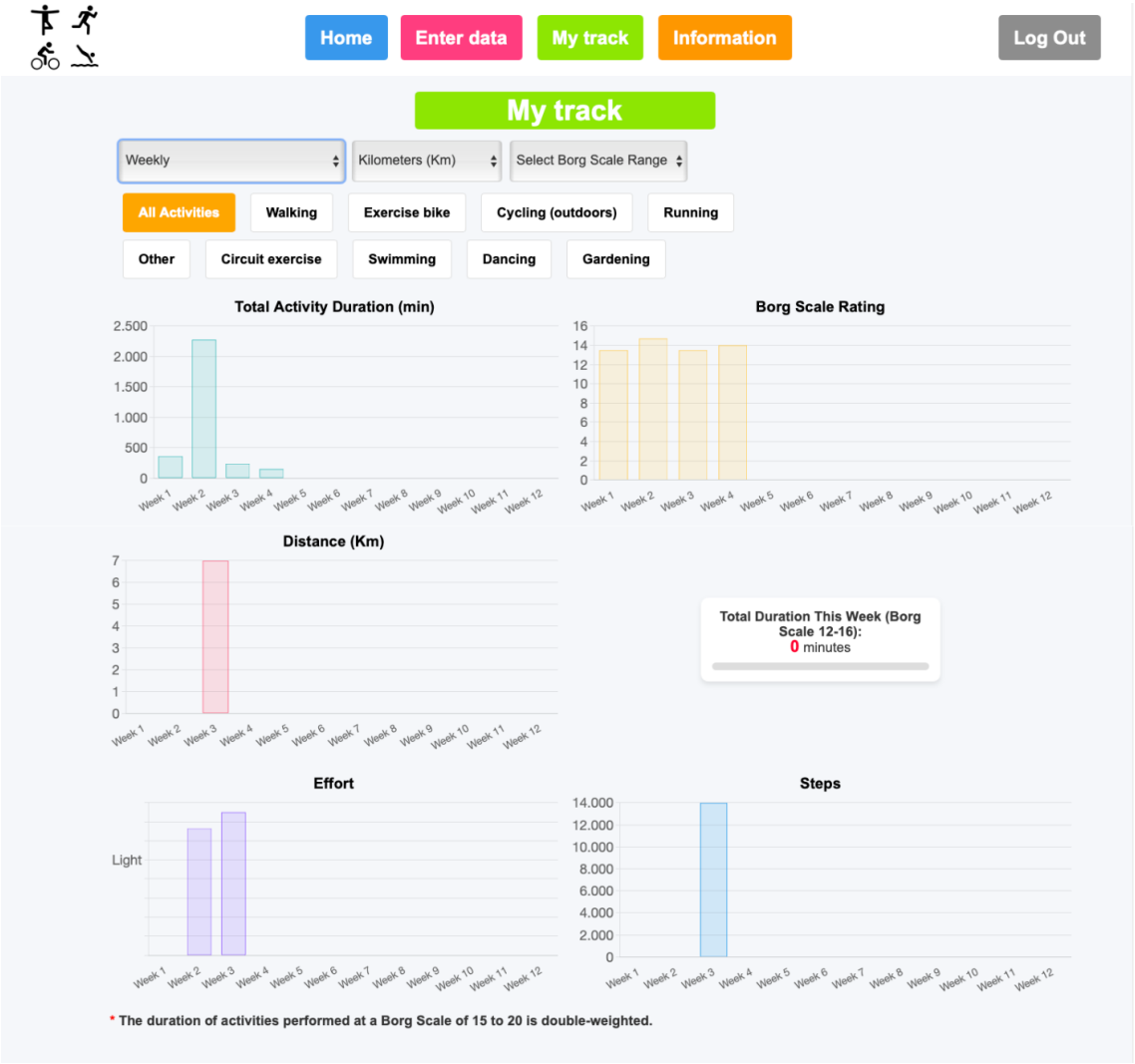

Figure 25. Patient's 'My track' page – East Galway Roscommon Integrated Care Hub Website. Own creation.

These changes were also implemented to the healthcare professionals' view of the patient activity graphs.

Additionally, the ‘Information’ page (Figure 26) has been customized to include information documents about the cardiac rehabilitation program.

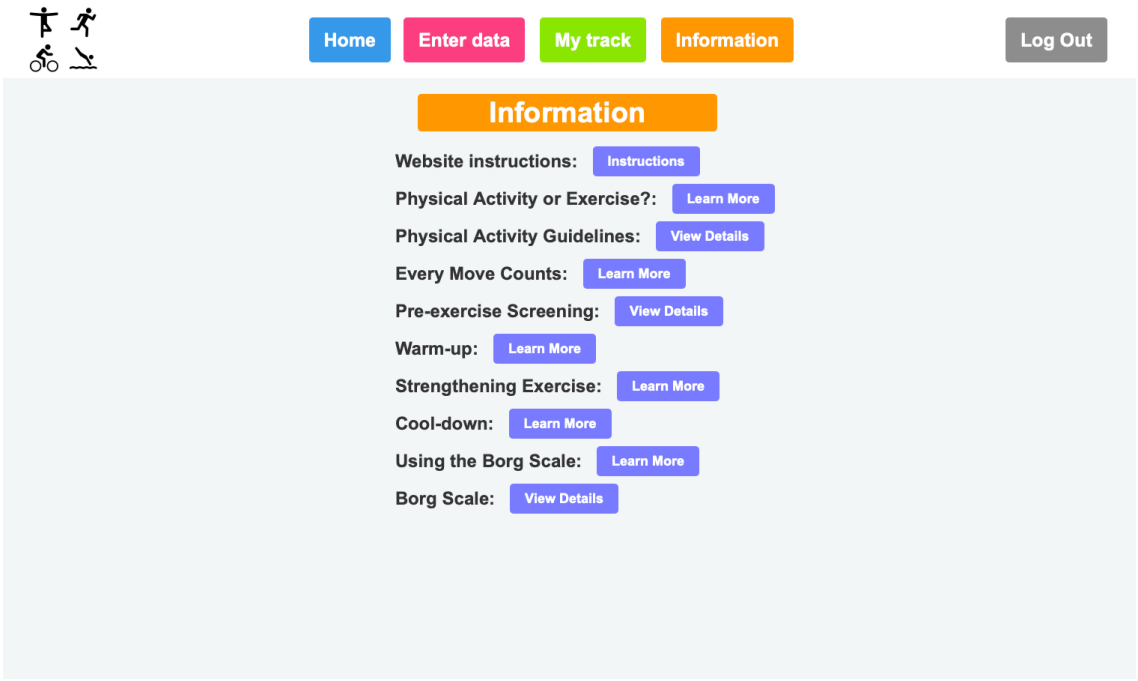

Figure 26. Patient's 'Information' page - East Galway Roscommon Integrated Care Hub Website. Own creation.

12.4. Annex D: Preprint: Open-Source Customizable Website to Follow-Up Physical Rehabilitation of Cardiovascular Patients at Home

The following pages in this annex contain the full text of the submitted preprint article:

Sabala, A., Mcbrearty, D., Salama, R., Farre, R., Loughnane, A., Otero, J., Farré, N. (2025). *Open-Source Customizable Website to Follow-Up Physical Rehabilitation of Cardiovascular Patients at Home*. Preprints.org. https://www.preprints.org/manuscript/202505.1703/v1

Open-Source Customizable Website to Follow-Up Physical Rehabilitation of Cardiovascular Patients at Home

Ariadna Sabala , Donough Mcbrearty , Raffaella Salama , Ramon Farre , Ailis Loughnane , Jorge Otero , Núria Farré *

Posted Date: 21 May 2025

doi: 10.20944/preprints202505.1703.v1

Keywords: cardiac rehabilitation; home monitoring; open-source website; healthcare follow-up; telemedicine; low-cost

Article

Open-Source Customizable Website to Follow-Up Physical Rehabilitation of Cardiovascular Patients at Home

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Abstract: Background: Telemedicine home monitoring of physical rehabilitation in cardiovascular patients, which may substantially improve adherence and, thus, prognosis and quality of life, is an underused practice. Indeed, the Apps and websites available are generic and cannot be easily adapted to each specific rehabilitation protocol. We thus aimed at developing a flexible, low-cost, and open-source telemedicine tool that can be customized and operated by any healthcare professional with just user-level internet knowledge. **Methods**: The website was co-designed by an interdisciplinary team, including website developers and clinical experts in physical rehabilitation programs for patients with cardiovascular diseases. The operability and robustness of the website were tested on simulated patients and health professionals, and the suitability of the tutorial for website customization was assessed. **Results**: The website asks the patient to complete a periodic diary of physical activities (e.g., intensity, type, duration, warm-up, cool-down, subjective effort). At any time, the patient can see graphs of the different types of exercise performed during a selected period. The website allows healthcare professionals to browse patients' data, send feedback messages, and export data in a conventional spreadsheet format. The tutorial for website customization was prepared as a learning by doing tool. **Conclusions**: The website developed can interest cardiovascular physical rehabilitation professionals aiming at quickly and cheaply setting up an approach for home monitoring programs. This telemedicine tool can also be customized to different clinical applications and is particularly well suited for low-resource settings.

Keywords: cardiac rehabilitation; home monitoring; open-source website; healthcare follow-up; telemedicine; low-cost)

1. Introduction

Physical exercise is good for health in general and especially as a tool in rehabilitation programs for patients with different diseases (e.g., cancer [2], respiratory disease [3], and pain [4]). In patients with atherosclerotic cardiovascular disease and heart failure, exercise training is associated with a reduction in hospitalization, adverse cardiovascular events, and mortality rates [5-7]. Therefore, the European and American Guidelines recommend patients with cardiovascular disease enroll in cardiac exercise rehabilitation [6,7].

Physical rehabilitation programs can be carried out at hospitals or other healthcare facilities. This clinical practice is excellent because healthcare professionals monitor the patient in person. However, the applicability and extension of rehabilitation programs for most patients who could benefit is limited. Indeed, the development of physical rehabilitation programs at healthcare premises is very

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expensive in terms of material infrastructure and labor requirements. It is also a problem for patients with time/work constraints or not living near such premises thus requiring expensive and bothering patient displacements. This problem is particularly relevant in rural areas with low-density populations and in underfinanced regions such as low- and medium-income countries [8]. Fortunately, developing rehabilitation programs at the patient's home overcomes these limitations and has shown effectiveness in a variety of pathologies, particularly in cardiovascular diseases [9]. However, to be effective in terms of patient adherence, a home rehabilitation program requires as much frequent follow-up as possible by health care staff. Whereas such follow-up is difficult to apply through in-person home care visits, it is feasible and effective to use telemedicine tools to facilitate patient-professional interaction [8]. Unfortunately, the few applications (Apps) and websites available for home monitoring are proprietary and generic and thus cannot be easily adapted to each specific rehabilitation protocol. The only conventional option would require high development costs entrusted to professional website designers. Therefore, to solve this problem, our work focused on designing and testing a website for the home follow-up of physical rehabilitation for patients with cardiovascular diseases. This telemedicine tool should be characterized by its simplicity for patients and staff, safety by ensuring patient anonymity, open-source availability for any user, and negligible exploitation costs. Our specific twofold aims were first to develop a website that any healthcare professional can download and use as it is. A second and more outreaching objective was to provide a user-friendly Tutorial allowing any healthcare professional without training in website design to customize the pages content to any specific application field.

2. Materials and Methods

2.1. Website design

We developed a website that can be directly and straightforwardly used by any professional aiming to set up a home cardiovascular rehabilitation follow-up. To this end we followed the innovative approach shown in Figure 1.

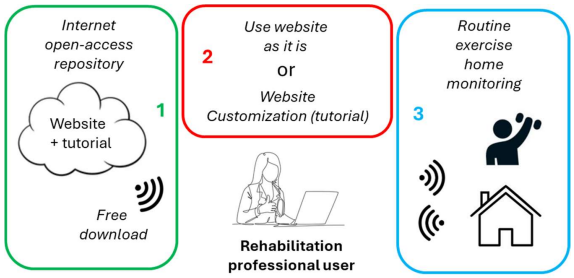

Figure 1. Diagram of the website to follow-up physical rehabilitation of cardiovascular patients at home. Any interested professional can download the website freely (1) and maintain its original format or customize it using the downloaded Tutorial (2). The website is ready for home monitoring patient rehabilitation (3).

The website template, which includes separate areas for patients and healthcare staff, was co-designed by an interdisciplinary team, including website developers and clinical experts in physical rehabilitation programs for patients with cardiovascular diseases. The part of the webpage for the patients is aimed at asking them to complete a periodic diary of different possible physical activities, including the date, type, and time, as well as data on the performance of a warm-up and cool-down and the Borg scale score during exercise (used for subjective self-monitoring through perception of effort). At any time, the patient should be able to see graphs of the data on the different types of

exercise performed during a selectable time window. The part of the webpage for healthcare professionals should allow them to browse and select the patients' diaries, observe their data in plot format, and send them a feedback message. The healthcare staff should also be able to export any required patient's data in a conventional spreadsheet format for further analysis.

Once the website prototype was implemented, its usability and reliability were tested by using simulated patients and healthcare staff involving more than 3000 transferred data and messages. Each simulated patient used the website to introduce the data on their daily rehab exercises, and the testing process was followed up by professionals playing the role of the healthcare staff in charge of the patient's rehabilitation program. At the end of the test, all the professionals involved checked whether there were incidents in the process and verified that all the patient's exercise data downloaded from the webpage for further data analysis were fully accurate and easily usable.

2.2. Website customization

To ensure that the website layout can be easily modified for different variants fitting the aims of potential users, we developed a Tutorial for health professionals with no expertise in website development (Supplementary material). The Tutorial has 3 different sections and is designed as a learning by doing tool [10]. The first section is addressed to healthcare professionals who are not familiar with the physical rehabilitation website. This section explains how this website works since it will be used as the original template for creating websites for other applications. The second section of the Tutorial provides step-by-step instructions on how to install the website, create users and verify its functionality. The third section presents two examples: the first one explains how to carry out minor modifications in the webpage template to adapt it to the user specific interest and application; the second example guides healthcare professionals who aim to use the website template to create a home follow-up application for a completely different application in any field of nursing, physiotherapy, and medicine, by using the example of creating a website for general healthcare follow-up

3. Results

3.1. Website design

3.1.1. Website platform.

The website was created focusing on minimum cost, easy usability, and the possibility to allow straightforward source cloning by any interested user. Among the many different public platforms available for building websites, Webflow™ was chosen to serve as the front-end (the visible part of the website) for its web cloning features. Indeed, this platform offers the possibility to post an entire website, e.g. the one we designed, in their 'Made in Webflow' section and to allow other Webflow users to clone this site freely. The Xano™ platform was selected because its 'Snippets' function allows the backend to be cloned easily. After cloning the original site, the user can rename the new website with any specific name (xxx) with the format 'https://xxx.webflow.io'. For instance, our web rehabilitation site was named https://exercise-follow-up-template.webflow.io/. If the user wants to replace the extension ".webflow.io" by a more common one (e.g., ".com") it is possible, at a very low cost (10-20 US$/year), to buy a website domain (i.e., address) and link it to the generated Webflow site.

The Tutorial in the Supplementary Material shows how any user can freely register on the platforms and clone the website and the backend for their use. Everything required for such cloning can be accessed freely. However, payment is required to achieve the website functionality, specifically to connect the front end to the back end. When following the Tutorial, this payment must be completed before performing any customizations. It involves upgrading the free website plan to a paid plan (see Supplementary Materials). It is interesting to mention that the cost (168 US$/year as of April 2025) is virtually free (<0.5 US$/day).

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3.1.2. Patient's interface

When the patient is included in the rehabilitation program website, the healthcare staff in charge provides them with a username and a password, e.g., randomly generated, thus ensuring full anonymity on the website and the internet. The entry point of the template website is the login page (Figure 2). Through this page, users are authenticated and then redirected to the patient's interface.

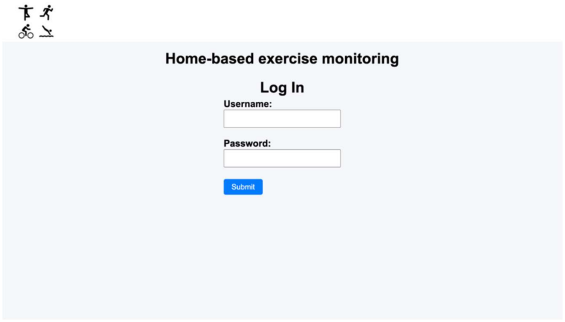

Figure 2. Login page.

When a patient logs in, they is directed to the patient's home webpage (Figure 3), where the messages interchanged with the healthcare staff can be seen, and the patient can send messages to the healthcare staff.

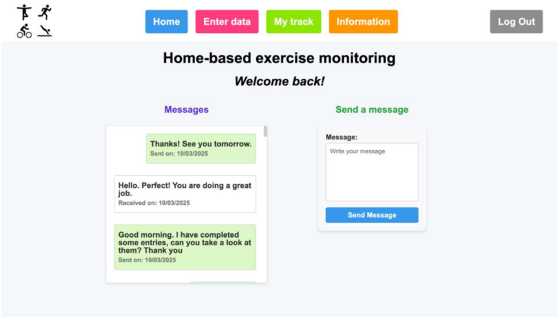

Figure 3. Patient's home page.

Then, using the menu on the top of the page the patient can go to 'Enter data', 'My track' and 'Information' pages, as well as log out. At the 'Enter data' page (Figure 4), the patient can complete the physical activity diary. The user can select a date, which is useful in case of reporting data of rehabilitation exercises from previous days. The exercise type can also be selected, and, if the patient has done an exercise type that is not included in the list, the 'Other' option can be selected, and a free text field will appear to specify it. Additionally, if a patient has exercised more than once a day, more entries can be made for that same day with the details of each physical activity.

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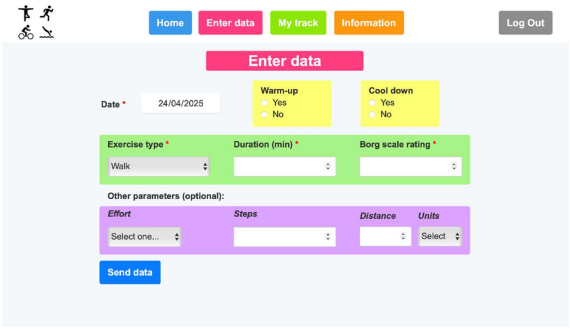

Figure 4. Patient's 'Enter data' page.

By clicking the 'My track' button in the top menu, the patient can see the time evolution of their exercises (Figure 5). Also, they can choose which exercise to see graphically and on which time scale.

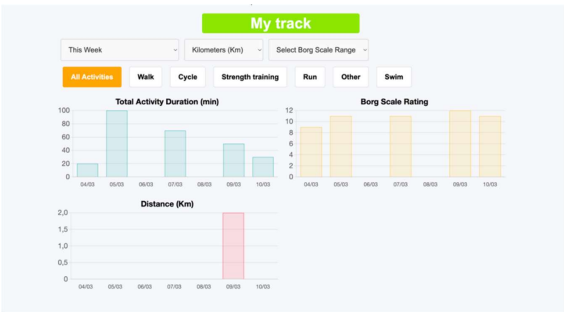

Figure 5. Patient's 'My track' page.

At the 'Information' page (Figure 6), the patient can download the website user instructions and any written or video information that the rehabilitation program has made available to them.

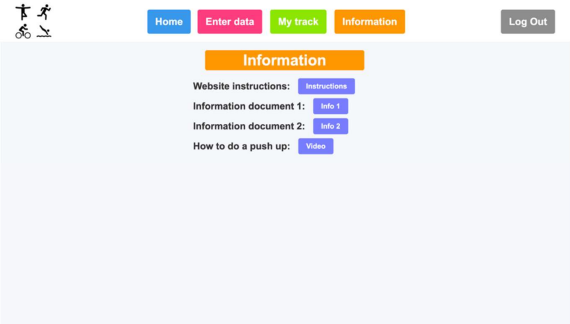

Figure 6. Patient's 'Information' page.

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By clicking at the 'Log Out' button on the top-right of any page, the user will be logged out of the website and redirected to the entry point, i.e., the login page.

3.1.3. Healthcare staff's interface

Users who are part of the healthcare staff will be automatically identified as a program professional (according to their username) and directed to the staff's home page (Figure 7). There, the most recent messages interchanged with patients can be seen (either all of them or filtered by patients). Also, messages can be sent by filling the 'Send a message' box with the patient's ID and the message.

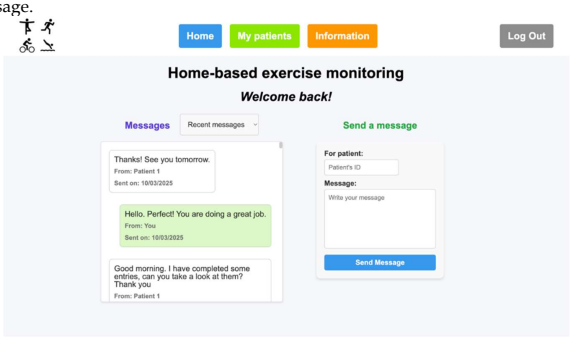

Figure 7. Healthcare staff's home page.

Through the menu on the top of the page, the staff user can go to 'My patients' or 'Information' pages, as well as log out. At the 'My patients' page (Figure 8), the user can browse and select among all the patients included in the home care program to see a graphical display of the time evolution of the patient's activities. In addition, the buttons below the graphs allow the professional to send a message to the patient (redirecting to the homepage), to download the data (in Excel™ format) corresponding to the graphs on the screen in an ('Download data for these filters' button), or to download all the data from all the patients ('Download data of all patients' button), so that any analysis tool can be used to further process the data. The Excel™ files data can be accessed by free readers.

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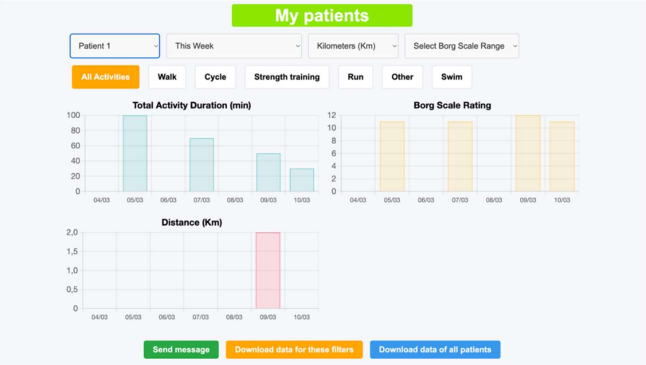

Figure 8. Healthcare staff's 'My patients' page.

The staff interface also has an 'Information' page (similar to that of the one in the patient homepage) (Figure 6) where the user can download the website instructions for staff and any other information that has been made available to patients. While being at any page the staff can log out by clicking at the 'Log Out' button at the top-right of the page.

The test on the simulated patients and professionals showed that both the patient and healthcare webpages are clear and user friendly, and it was verified that there were no errors in the downloaded data as compared with the ones introduced in the rehabilitation diaries. The designed websites were satisfactorily tested using the most widely used internet browsers (Google Chrome, Safari, Microsoft Edge, Mozilla Firefox, and Opera) [11].

3.2. Website customization

The previously shown website for physical rehabilitation can be used as a template for slightly modifying it or for creating a different website for other applications in homecare follow-up, as explained in detail in the Tutorial (Supplementary Materials). The second example of the Tutorial's third section focuses on the steps to follow for modifying the questions to ask the patient and for redesigning the webpage appearance. Given that the Tutorial is designed as a learning by doing tool for healthcare users with no previous training in website construction, the reader is asked to create a new website example aimed at following up issues regarding the general health status of the patient. This example is not comprehensive and thus not aimed at immediate use, it is simply intended for illustrating the process for website customization. When the reader fulfils the Tutorial tasks, they is able to create a website for following-up patient objective behaviors (medication compliance, sleep time, exercise duration, smoking, alcohol drinking, and eating) and their subjective perceptions (sleep quality, exercise effort and general wellbeing), as illustrated in Figure 9. The "My track" page then shows the time course of the new variables (Figure 10) after making some modifications. The Tutorial also describes how to modify other webpage details, e.g., to change webpage logo and presentation or modify the files in the 'Information' pages.

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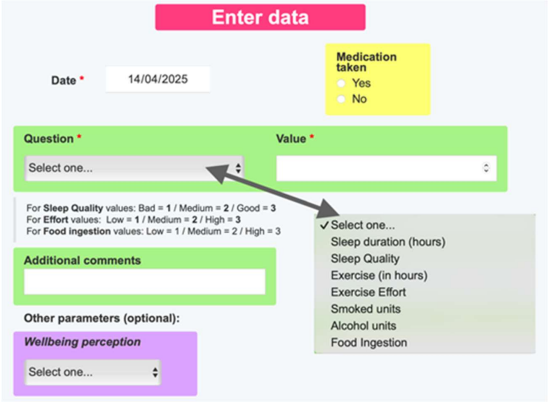

Figure 9. Patient's 'Enter data' page in the new customized webpage following the Tutorial (Supplementary Materials)

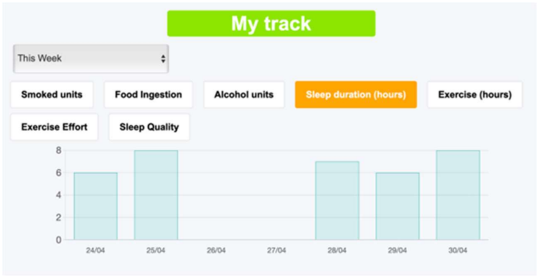

Figure 10. Patient's 'My track' page in the new customized webpage following the Tutorial (Supplementary Materials)

The estimated time required to perform the different tasks described in the Tutorial by a person who has a user-level knowledge of internet, not trained in webpage construction, were the following: 1) 1.5 -1.75 h to clone and install the website as it is , 2) 0.5-0.75 h to implement a simple variant of the downloaded website, and 3) 1.25-1.5 h to customize it to for a different application in another healthcare application.

4. Discussion

The telemedicine tool we present in this work enables any professional in the field of physical rehabilitation of patients with cardiovascular diseases to immediately and straightforwardly initiate a home care monitoring program by directly using the developed website. Moreover, the Tutorial we propose may allow that, after a minimum training, any healthcare professional without previous experience in website design is able to customize the patient's and healthcare professional's pages for home monitoring in any clinical specialty beyond physical rehabilitation.

We based our telemedicine tool on public internet platforms to avoid requiring the use of proprietary information and communication networks (e.g., from hospitals or other institutions). This enables any healthcare professional to use the website in regions with poorly available Information and Communication Technology provisions from specific institutions, as is common in small or rural healthcare centers or in private practices. The two commercial internet platforms we selected provide

the highest data security, processing integrity, privacy, and confidentiality according to most rigorous safety standards (SOC 2 Type 2 certification). Moreover, it is noteworthy that the website was designed to ensure full patient's privacy protection. Indeed, on the one hand, no personal or clinical data related to the patient's health is introduced into the website (only anonymous data on daily exercise). Furthermore, the patient's username and password can be randomly generated by the healthcare professional, hence including no information relative to the patient. Interestingly, the code file linking each patient with their username and password can be kept in a private file curated by the healthcare professional and stored in a physical repository outside the internet and even outside any computer.

The webpages we designed were deliberately simple to facilitate usability for most patients and healthcare professionals. For instance, each tab in the patient page is contained in a single screen, the labels and windows to introduce data are great enough to enhance visibility for aged patients or those with visual limitations, and colors belong to a blind color friendly palette [12]. For the sake of simplicity and flexibility, the data processing and viewing in the healthcare professional page was minimized. Alternatively, allowing the data to be downloaded into a conventional data sheet format makes it possible that any healthcare user involved in the program to further define a specific graphical and statistical processing format. Also, for simplicity we avoided including video calls, with the bidirectional patient-healthcare professional communication based on written messages into the website. If deemed necessary, nowadays a video call can always be established by widespread conventional tools. Interestingly, the website is designed for friendly appearance in both computer, tablet or mobile phone screens. The latter can be particularly useful for open-source initiatives for home monitoring in low- and middle-income countries, where mobile phones are progressively ubiquitous [14].

A remarkable feature of our approach in developing this telemedicine tool was its flexibility to be easily customized for a wide range of applications in home monitoring of patients with different health diseases. As illustrated by the customization section in the Tutorial (a simple possible example for general healthcare follow-up), the website questions and pages layout can be easily modified to cover almost all questions that any home came program may need, e.g., in endocrinology, pneumology, sleep disturbances, neurology, psychiatry, postoperative and elder patient care, high-risk pregnancies monitoring, or neonatal follow-up [15-18]. It could be also possible to customize the website for professional team-building purposes or for improving coordination among healthcare staff in places without availability of professional communication networks [19-21]. For instance, following the rationale and structure of the website template we present herein, the role of the patients can be replaced by health community workers or small rural/local centers, and reference hospitals can play the role of the health professionals as network coordinators. Accordingly, instead regarding exercise activity, the data interchanged among them could be on a variety of aspects related to clinical practice (e.g., diseases incidence, treatments application, waiting lists or professional inter-consultation), thus allowing to set up an empowering customized network to improve patient's healthcare. Most importantly, with the aid of the Tutorial, such website customization can be carried out by health professionals who are not experts in the construction of webpages, and simply requires internet access, with no need for institutional digital networks availability.

5. Conclusions

First, the website developed and presented herein can be of interest for cardiovascular physical rehabilitation professionals aiming at quickly setting up a free tool for home monitoring programs. Second, this telemedicine tool can be customized for different fields of health care applications. Finally, being open-source, very low-cost, and not requiring institutional digital infrastructure, this approach can be of particular interest in low-resource settings.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org.

Authors Contributions: Conceptualization: A.S., N.F.; Technological design: A.S., R.S. R.F., J.O.; Healthcare design: D.M., A.L., N.F.; Website development: A.S.; original draft preparation: A.S., N.F.; final manuscript edition and project direction: N.F. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest: The authors declare no conflicts of interest.

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12.5. Annex E: Execution schedule details

This annex includes the tables referenced in Section 6 (Execution schedule), specifically the detailed Work Breakdown Structure (WBS) and the task scheduling used for the PERT-CPM and GANTT analyses.

Table 11. Detailed breakdown of the tasks in the WBS diagram

1. Requirements analysis and system design
1.1. Requirements and functionalities
1.1.1. | Review existing program documentation
Review all relevant documentation provided by the *East Galway Roscommon Integrated Care Hub*, including information on the existing cardiac rehabilitation program, patient workshops, and the value proposition.
Deliverables: None
Duration: 1 day
1.1.2. | Define user and system needs with stakeholders
Conduct meetings with professionals at the *East Galway Roscommon Integrated Care Hub* to clarify the proposal and establish the platform needs.
Deliverables: None
Duration: 2 days
1.1.3. | Define functional and non-functional requirements
Produce a detailed list of the functional and non-functional requirements of the platform.
Deliverables: Functional and non-functional requirements document
Duration: 1 day
1.2. System architecture design
1.2.1. | Define platform requirements
Establish the evaluation criteria to be used when comparing different front-end and backend technologies.
Deliverables: Platform evaluation criteria document
Duration: 1 day
1.2.2. | Research front-end and back-end platforms
Conduct research and try different front-end and back-end platforms, try their functionalities and verify whether they achieve the criteria defined or not.
Deliverables: None
Duration: 14 days
1.2.3. | Select final platform/s
Choose the best platform that fits most of the criteria or all of them.
Deliverables: None
Duration: 1 day
1.3. Website mockup
1.3.1. | Design user interface mockup
Create a mockup of the website. This will be used as a guide during front-end development.
Deliverables: PowerPoint presentation with mockup design.
Duration: 2 days
2. Development and testing of the platform
2.1. Front-end development

2.1.1.	Develop user access and navigation
Implement the page structure, navigation menu, and logo of the website. Develop a user authentication system and implement role-based access control.	
Deliverables: Functional navigation menu and access control system, implemented and tested.	
Duration: 20 days	
2.1.2.	Implement the website's main functions
Develop the website's main features: a messaging system, exercise data form, graph visualization with filters, a data download functionality.	
Deliverables: Core platform functionalities (messaging, data form, graph visualization, downloads), implemented and tested.	
Duration: 60 days	
2.1.3.	Upload information documents
Upload documents to the information pages of the website.	
Deliverables: Information documents uploaded and accessible on the platform.	
Duration: 1 day	
2.1.4.	Adapt user interface to different screen sizes
Ensure that the user interface is responsible and adapts correctly to different screen sizes (desktop, tablet and smartphone).	
Deliverables: Responsive interface implemented and verified across different screen sizes.	
Duration: 7 days	
2.2. Back-end development	
2.2.1.	Design the database schema
Define the structure of the website's database.	
Deliverables: Database schema design document.	
Duration: 2 days	
2.2.2.	Implement the database schema
Create the defined databases using the selected platform/technology.	
Deliverables: Working and implemented database structure.	
Duration: 1 day	
2.2.3.	Design API endpoints
Define the required API endpoints and their functionality.	
Deliverables: None	
Duration: 5 days	
2.2.4.	Implement API endpoints
Develop and test the API endpoints.	
Deliverables: Functional API endpoints tested and connected to front-end.	
Duration: 15 days	
2.3. Integration testing	
2.3.1.	Test overall platform functionality
Conduct a test of all platform functionalities to ensure proper integration between front-end and back-end components. and verify the functioning of all the functionalities of the website. Make improvements if necessary.	
Deliverables: Fully functional and tested website.	
Duration: 10 days	
2.4. User testing	
2.4.1.	Test the website's performance and usability
Conduct testing with simulated patients and healthcare professionals to evaluate usability and performance.	
Deliverables: Feedback report from the test with simulated patients and health professionals.	

Duration: 10 days	
3. Manual creation	
3.1. Designing the manual structure	
3.1.1.	Define example cases of website customization
Define representative web customization use cases that can be used to teach healthcare professionals how to adapt the platform.	
Deliverables: None.	
Duration: 3 days	
3.1.2.	Outline manual format
Establish the structure and format of the manual to ensure ease of use.	
Deliverables: Manual structure	
Duration: 1 day	
3.2. Writing the manual	
3.2.1.	Draft the content of the manual
Write the manual sections while verifying that each feature functions as described.	
Deliverables: Draft version of the manual	
Duration: 30 days	
3.2.2.	Conduct user testing and revise manual
Test the manual with naïve users, gather feedback and improve content of the manual.	
Deliverables: Revised and final version of the manual	
Duration: 5 days	
4. Scientific publication	
4.1. Drafting	
4.1.1.	Co-write the scientific publication
Collaborate with co-authors to write the different sections of the scientific article.	
Deliverables: Draft manuscript	
Duration: 7 days	
4.1.2.	Incorporate feedback from all authors
Ask for feedback from all the authors involved.	
Deliverables: Reviewed manuscript	
Duration: 5 days	
4.2. Submission	
4.2.1.	Submit preprint version
Upload the preprint version of the article.	
Deliverables: Link to the preprint version	
Duration: 1 day	
4.2.2.	Submit to scientific journals for review
Submit the article to selected peer-reviewed journals for evaluation and potential publication.	
Deliverables: None	
Duration: 2 days	
5. Project management and closure	
5.1. Planning	
5.1.1.	Bibliographic research
Perform bibliographic research to understand the context, background and existing solutions. Conduct a market analysis.	
Deliverables: Background section, Market analysis section.	

Duration: 5 days
5.1.2. Define objectives and project scope
Define the goals of the projects, and what will and won't be included.
Deliverables: Introduction section
Duration: 1 day
5.1.3. Create timeline and planning documents
Develop a schedule including the WBS, task durations, precedence relationships, CPM/PERT analysis, and a Gantt chart.
Deliverables: Execution schedule section
Duration: 2 days
5.2. Progress tracking
5.2.1. Meet with Galway healthcare professionals
Conduct periodic meetings to share progress and gather feedback.
Deliverables: Meeting notes, change requests.
Duration: 4 days
5.2.2. Meet with final degree project tutor
Present updates to the final project tutor for ongoing guidance.
Deliverables: None
Duration: 8 days
5.3. Final defense
5.3.1. Draft the final degree project report
Write the first version of the report.
Deliverables: Draft report
Duration: 35 days
5.3.2. Finalize and submit the report
Incorporate feedback and submit the final version of the report.
Deliverables: Final report
Duration: 5 days
5.3.3. Prepare defense presentation
Design and prepare the final project presentation for the oral defense.
Deliverables: Presentation slides
Duration: 5 days

Table 12. Task execution schedule used in PERT-CPM analysis and GANTT diagram creation

ID	Task	Duration	ES	EF	LS	LF	Slack	Precedent task
1.1.1.	Review existing program documentation	1	0	1	0	1	0	-
1.1.2.	Define user and system needs with stakeholders	2	1	3	1	3	0	1.1.1.
1.1.3.	Define functional and non-functional requirements	1	3	4	3	4	0	1.1.2.
1.2.1.	Define platform requirements	1	4	5	4	5	0	1.1.3.

1.2.2.	Research front-end and back-end platforms	14	5	19	5	19	0	1.2.1.
1.2.3.	Select final platform/s	1	19	20	19	20	0	1.2.2.
1.3.1.	Design user interface mockup	2	4	6	18	20	14	1.1.3.
2.1.1.	Develop user access and navigation	20	20	40	20	40	0	1.2.3., 1.3.1., 5.1.3.
2.1.2.	Implement the website's main functions	60	40	100	40	100	0	2.1.1.
2.1.3.	Upload information documents	1	40	41	99	100	59	2.1.1.
2.1.4.	Adapt user interface to different screen sizes	7	100	107	100	107	0	2.1.2., 2.1.3.
2.2.1.	Design the database schema	2	4	6	85	87	81	1.1.3.
2.2.2.	Implement the database schema	1	6	7	91	92	85	2.2.1.
2.2.3.	Design API endpoints	5	6	11	87	92	81	2.2.1.
2.2.4.	Implement API endpoints	15	11	26	92	107	81	2.2.2., 2.2.3.
2.3.1.	Test overall platform functionality	10	107	117	107	117	0	2.1.4., 2.2.4.
2.4.1.	Test the website's performance and usability	10	117	127	117	127	0	2.3.1.
3.1.1.	Define example cases of website customization	3	127	130	127	130	0	2.4.1., 5.2.2.
3.1.2.	Outline manual format	1	127	128	129	130	2	2.4.1.
3.2.1.	Draft the content of the manual	30	130	160	130	160	0	3.1.1., 3.1.2.
3.2.2.	Conduct user testing and revise manual	5	160	165	160	165	0	3.2.1
4.1.1.	Co-write the scientific publication	7	165	172	165	172	0	3.2.2.
4.1.2.	Incorporate feedback from all authors	5	172	177	172	177	0	4.1.1.
4.2.1.	Submit preprint version	1	177	178	177	178	0	4.1.2.

4.2.2.	Submit to scientific journals for review	2	178	180	178	180	0	4.2.1.
5.1.1.	Bibliographic research	5	1	6	12	17	11	1.1.1.
5.1.2.	Define objectives and project scope	1	6	7	17	18	11	5.1.1.
5.1.3.	Create timeline and planning documents	2	7	9	18	20	11	5.1.2.
5.2.1.	Meet with Galway healthcare professionals	4	117	121	176	180	59	2.1.2., 2.3.1.
5.2.2.	Meet with final degree project tutor	8	1	9	119	127	118	1.1.1.
5.3.1.	Draft the final degree project report	35	180	215	180	215	0	4.2.2., 5.2.1.
5.3.2.	Finalize and submit the report	5	215	220	215	220	0	5.3.1.
5.3.3.	Prepare defense presentation	5	220	225	220	225	0	5.3.2.

12.6. Annex F: Implementation and customization manual

This annex provides the manual detailing how to implement the website as-is and how to customize it for different applications.

Physical Rehabilitation Monitoring Website

Implementation and Customization Manual

This manual provides a description of the website and step-by-step instructions on how implement it as it is or customize it for a completely different application in any field of nursing, physiotherapy and medicine.

Version 1.0 – April 2025

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Universitat de Barcelona

UNIVERSITAT DE BARCELONA

Physical Rehabilitation Monitoring Website

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Index

As seen in the index, this manual is divided into three parts:

- **Website Template Description** – Learn how the website works.

- **Website Template Implementation** – Follow the steps to set up and test the website.

- **Website Template Customization** – Contains two examples of how to adapt the website to different needs. Choose the example that best suits your needs.

Website Template Description

The entry point of the template website is the login page (Figure 1). Through this page, users are authenticated and then redirected to the patient's interface, if they are patients, or to the healthcare professionals' interface, if they are staff members.

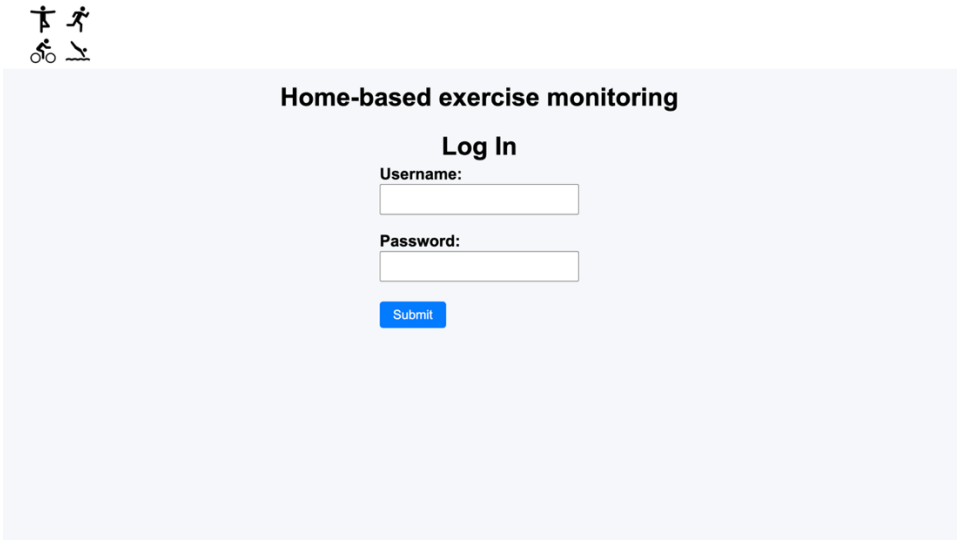

Figure 1. Login page

1. Patient's interface

When a patient logs in, they are directed to the patient's home webpage (Figure 2), where the messages interchanged with the healthcare staff can be seen, and the patient can send messages to the healthcare staff.

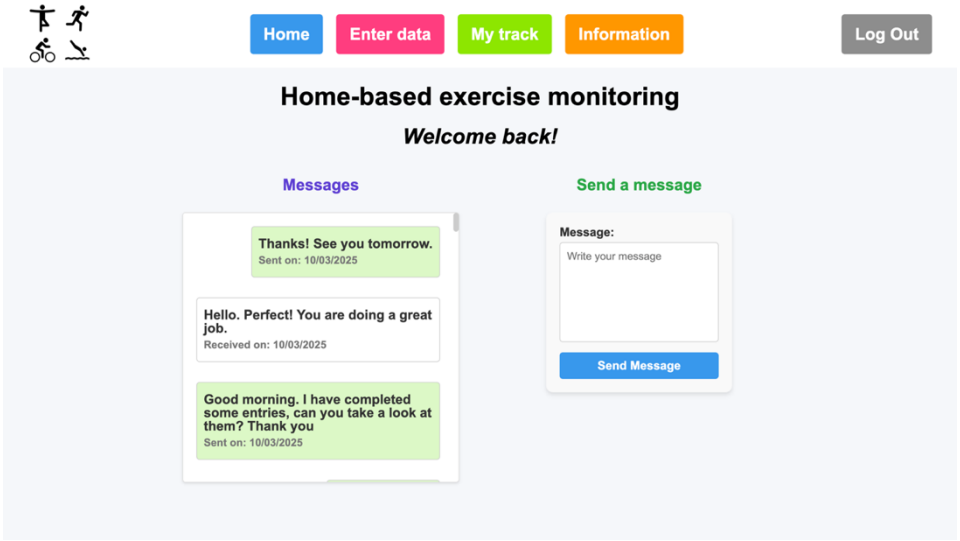

Figure 2. Patient's home page

Then, using the menu on the top of the page the patient can go to 'Enter data', 'My track' and 'Information' pages, as well as log out. At the 'Enter data' page (Figure 3), the patient can complete the physical activity diary. The user can select a date, which is useful in

case of reporting data of rehabilitation exercises from previous days. The exercise type can also be selected, and, if the patient has done an exercise type that is not included in the list, the 'Other' option can be selected and a free text field will appear to specify it. Additionally, if a patient has exercised more than once one day, more entries can be made for that same day with the details of each physical activity.

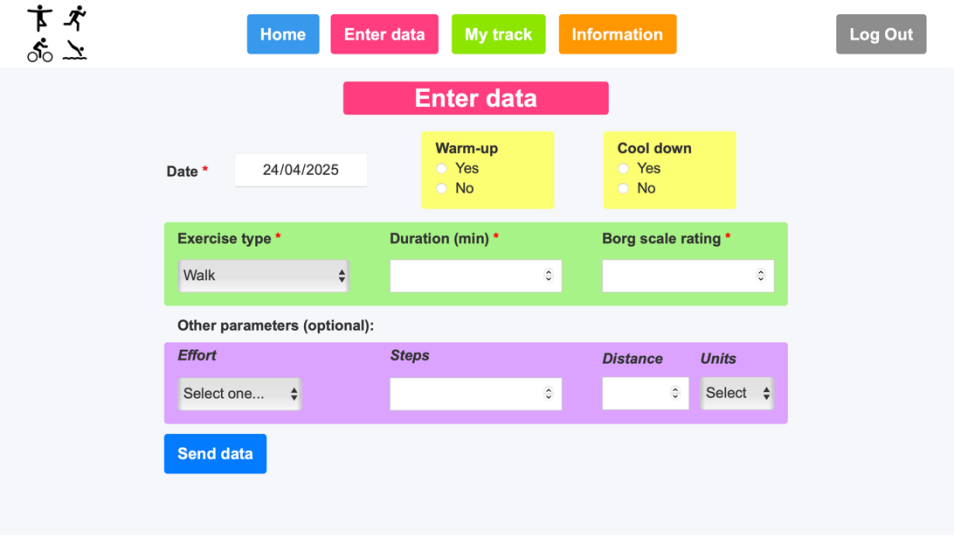

Figure 3. Patient's 'Enter data' page

By clicking the 'My track' button in the top menu, the patient can see the time evolution of their exercises (Figure 4). Also, users can choose which exercise to see graphically and on which time scale.

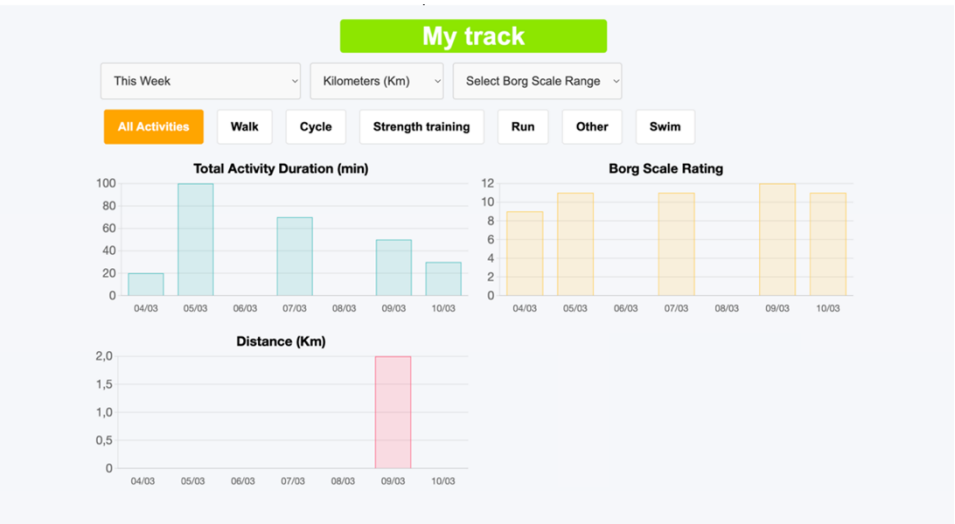

Figure 4. Patient's 'My track' page

Then, at the 'Information' page (Figure 5), the patient can download the website user instructions and any written or video information that the rehabilitation program has made available to them.

Figure 5. Patient's 'Information' page

By clicking at the 'Log Out' button on the top-right of any page, the user will be logged out of the website and redirected to the entry point, the login page.

2. Healthcare staff's interface

Users who are part of the healthcare staff, will be directed to the staff's home page (Figure 6). There, the most recent messages interchanged with patients can be seen (either all of them or filtered by patient). Also, messages can be sent by filling the 'Send a message' box with the patient's ID and the message.

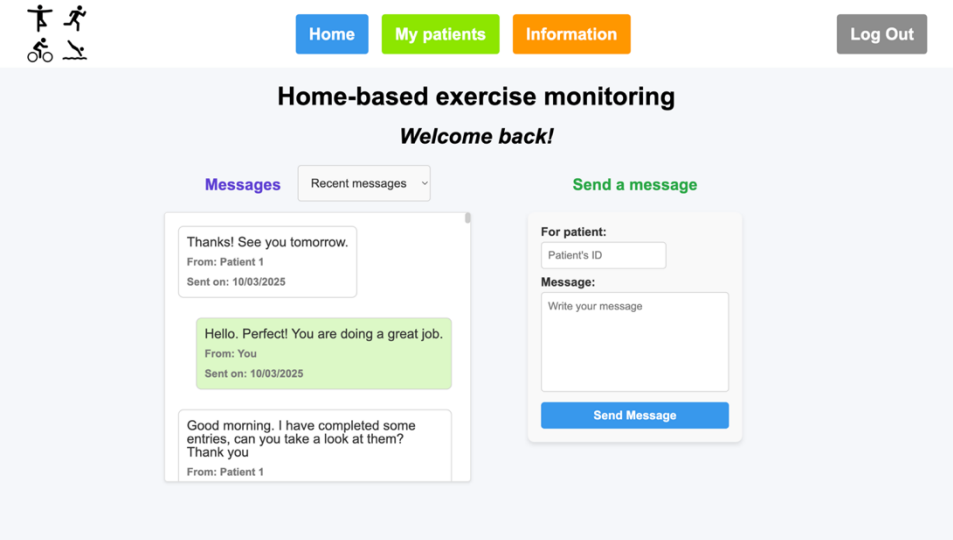

Figure 6. Healthcare staff's home page

Through the menu on the top of the page, the staff user can go to 'My patients' or 'Information' pages, as well as log out.

At the 'My patients' page (Figure 7), the user can browse and select among all the patients included in the home care program to see a graphical display of the time evolution of the patient's activities. In addition, the buttons below the graphs allow the

professional to send a message to the patient (redirecting to the 'Home' page), to download the data corresponding to the graphs in an Excel format ('Download data for these filters' button), or to download all the data from all the patient ('Download data of all patients' button), so that any analysis tool can be used to further process the data.

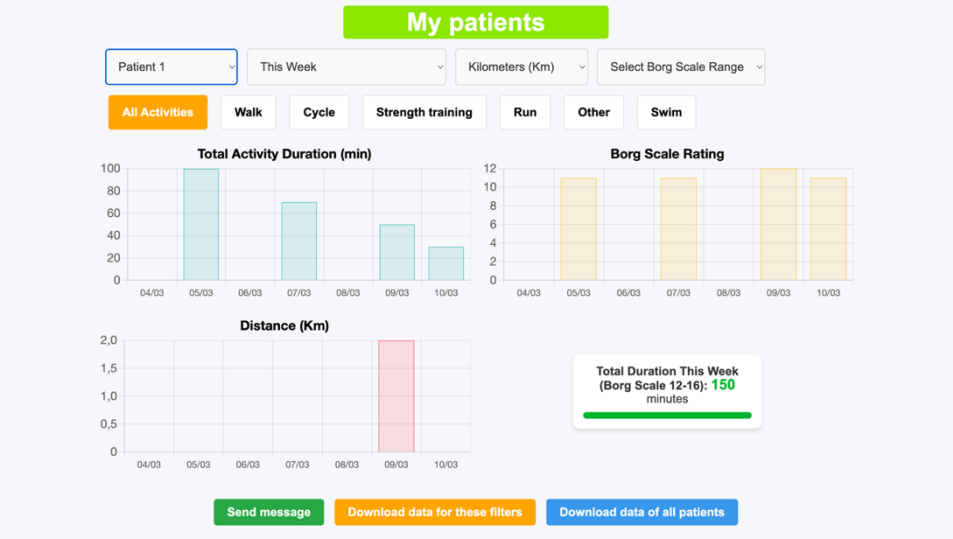

Figure 7. Healthcare staff's 'My patients' page

Lastly, the staff interface also has an 'Information' page (Figure 8) where the user can download the website instructions for staff and any other information that has been made available. Also, at any page the staff can log out by clicking at the 'Log Out' button at the top-right of the page.

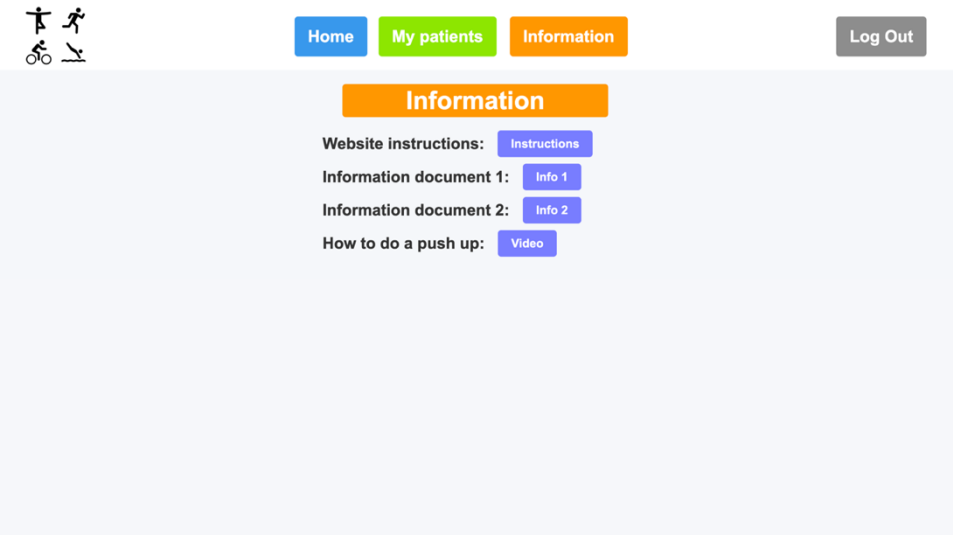

Figure 8. Healthcare staff's 'Information' page

Website Template Implementation *(1h 30min – 1h 45min)*

1. Getting Started

Before starting the installation process, you will need to create an account in both **Webflow** and **Xano**.

- **Webflow** is the platform that will be used to design and publish the frontend of the website (the part that users of the website see).
- **Xano** is the platform that will act as the backend (where the website's data is stored and managed).

Throughout this manual, we will use **Webflow** to modify the visual elements of the website. Each time we make changes, we will publish them so they appear in the live site. **Xano** will be used less frequently, mainly for connecting it with Webflow and for occasional modifications.

In this section, you will find the instructions on how to create both a Webflow and a Xano account. These accounts will later be used to copy (or 'clone') the frontend and the backend of the website.

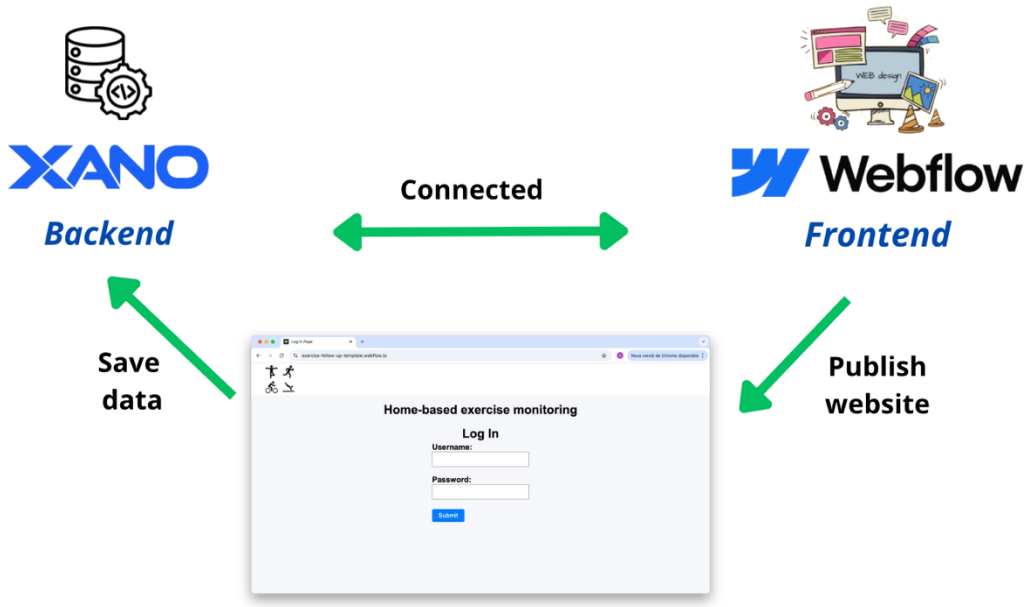

Figure 9. Diagram of the platforms used for the website implementation

1.1. Creating a Webflow account

Note: The goal of this section is to create a Webflow account. *If any questions or screens appear differently than described, do not worry. The goal is to successfully create your Webflow account* ***and*** *ensure that you* ***verify it****.*

1. Go to Webflow's website.

2. Click the **'Get started – it's free'** button at the top-right of the page (Figure 10)

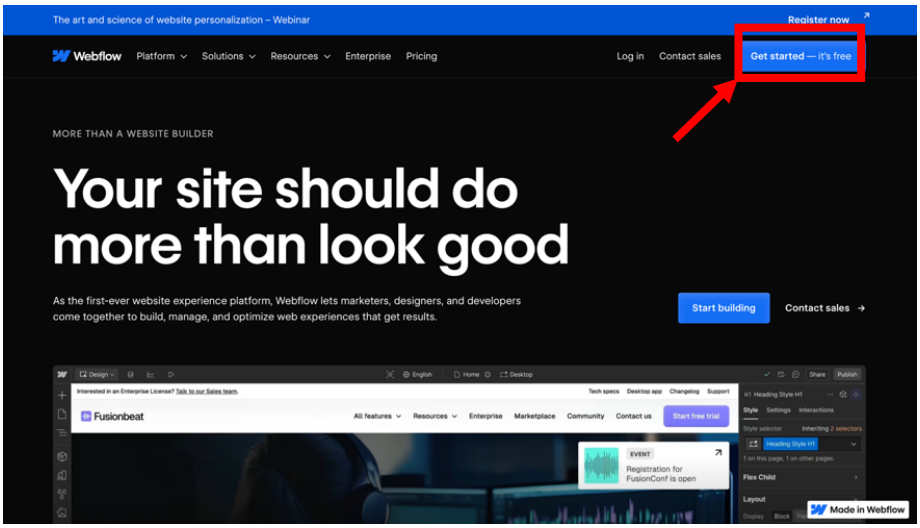

Figure 10. Webflow's home page

3. In the registration form (Figure 11):

- Enter an email and click ***Continue***.
- Create a password that meets the requirements.

(If preferred, you can also sign in with Google. If you choose this option, you will not be asked to verify your email and can skip step 4.)

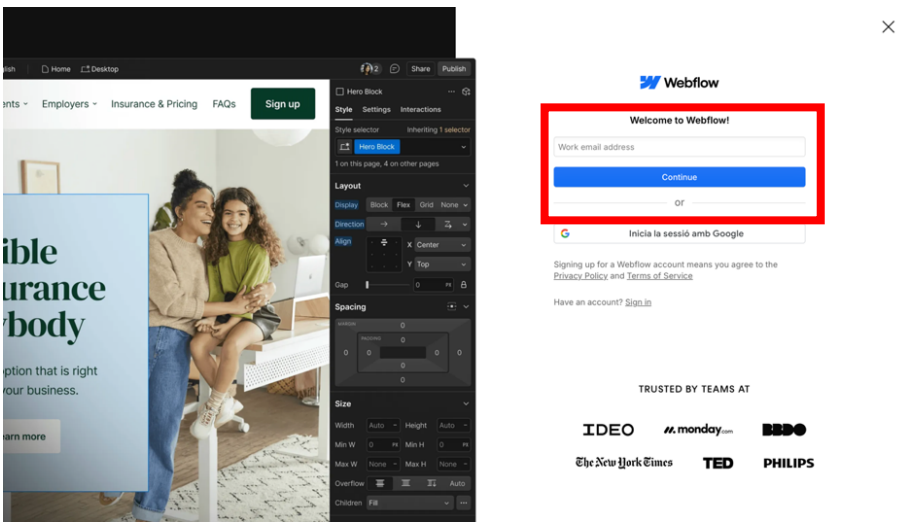

Figure 11. Webflow's registration form page

4. **Go to your email** and **click at the link** sent to you to **verify your account**. This is a very important step.

5. Return to the Webflow page you were before. Fill the questions and click *Continue* (Figure 12).
   For more details, refer to steps 5.1-5.3.

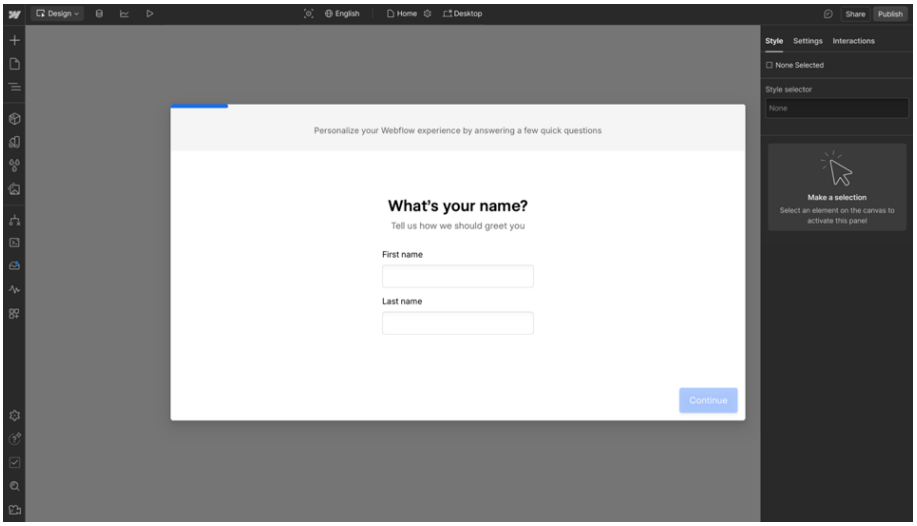

Figure 12. Webflow's initial questions

5.1. Answer the following questions however you prefer:
- 'What's your name?'
- 'What do you want to build websites for?'
- 'Are you a student?'
- 'What type of site are you looking to build today?'

This will not affect the site we create later.

5.2. When asked:
- 'Are you interested in hiring someone to help build your site today?'

Select ***No***.

5.3. To the question:
- **'Select a way to get started'**

Choose ***Blank site***.
A default site name will be generated, leave it as it is and click ***Create site***.
This name does not matter, as we will not use this website later.

6. Wait for the default website to be loaded.
    - Then, hover your mouse over the **'W' logo** in the top-left corner of the screen.

    - A **menu icon (three horizontal lines)** will appear (Step 1- Figure 13), **click it**.

    - Select ***Dashboard*** (Step 2 - Figure 13).

    - This will take you to your Webflow Workspace, where the default blank site we just created will appear. You can delete this blank site, as we will not use it.

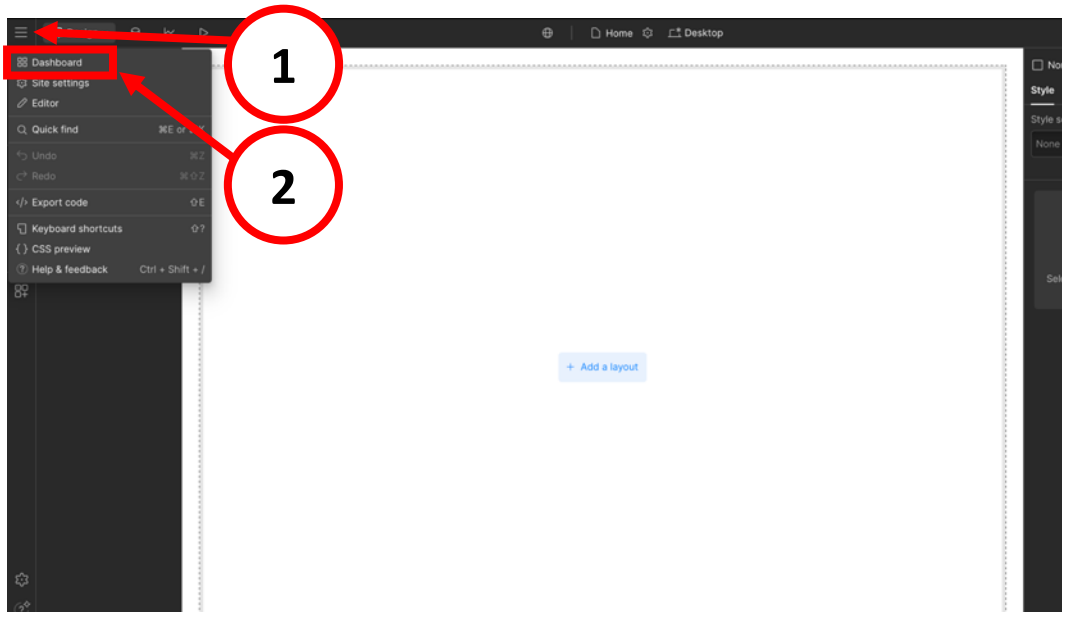

Figure 13. Webflow's default blank site

7. **Congrats!** You have successfully created your Webflow account.

1.2. Creating a Xano account

Note: The goal of this section is to create a Xano account. *If any questions or screens appear differently than described, do not worry, continue with the process. The goal is to create an account.*

1. Go to Xano's website: https://www.xano.com/. **Use Google Chrome**.

2. Click the **'Get started for free'** button at the top-right of the page (Figure 14).

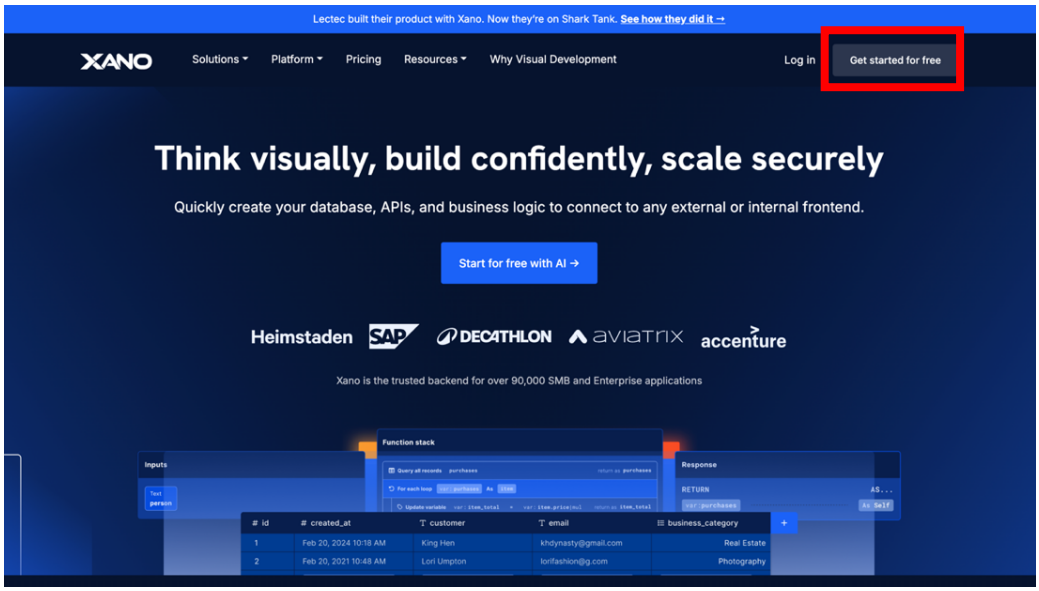

Figure 14. Xano's home page

3. In the registration form (Figure 15):

- Fill out the details
- Click ***Sign up***

(If preferred, you can also sign up with Google or Github to create your account)

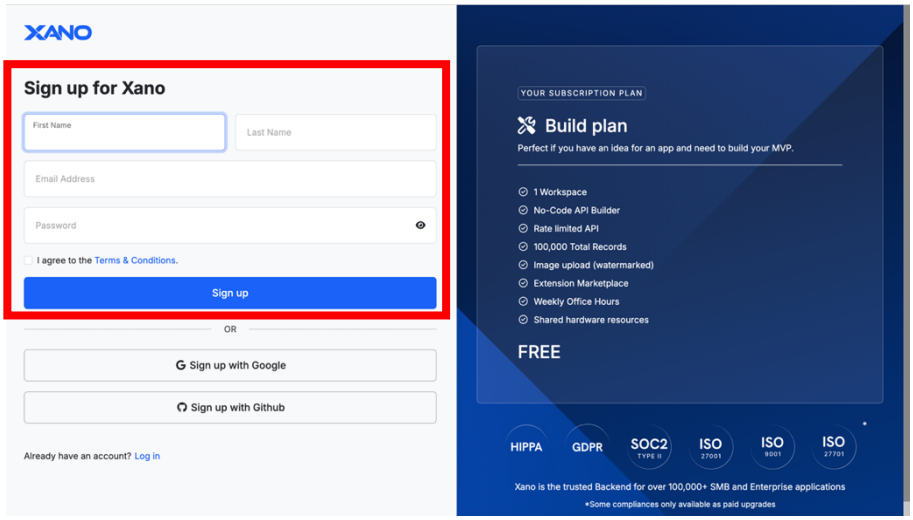

Figure 15. Xano's registration form page

4. Complete the set-up questions and click *Continue* (Figure 16).
Refer to steps 4.1-4.4 for details.

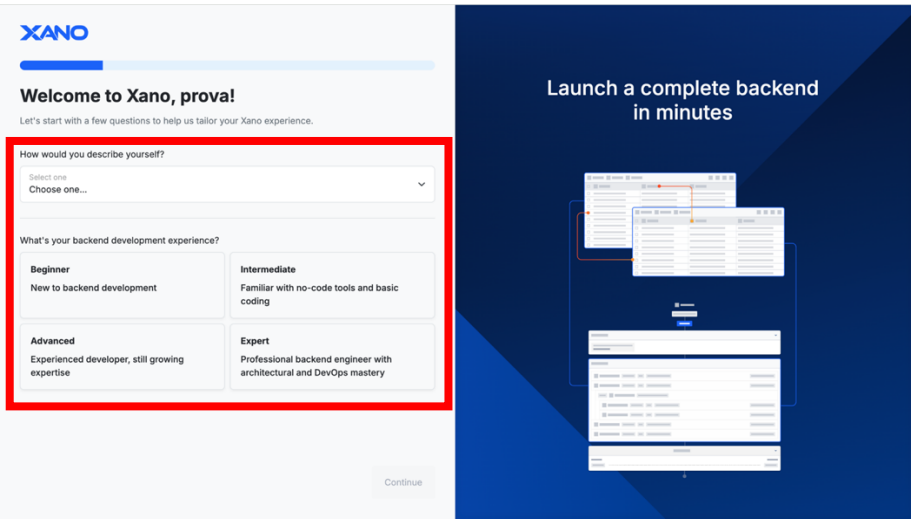

Figure 16. Xano's set-up questions

Note: If you see slightly different or additional questions, don't worry. Answer them, this won't affect the creation of our site.

4.1. Answer the following questions however you prefer:
- 'Where do you work?'
- 'What's your backend development experience?'

Your answers will not affect the process.

4.2. To the question:
- 'What would you like to do?'

Feel free to choose any option. For example, you can select ***Build an app***.

4.3. When asked:
- 'How would you like to get started?'

Answer ***Start from scratch***.

4.4. On the **'Finalize your Workspace'** page:
- Enter a name for your workspace. For example, **'Website'**.
- To the questions:
  - 'What tool or front-end will Xano be connected to?'
    Select ***Front-end***.
  - 'What front-end do you plan to use?'
    Select ***Webflow***.
- **Uncheck** the option **'Set up authentication for me'**.
- Click ***Create workspace***.

5. **Congrats!** You have successfully created your Xano account, where data will be stored.

2. Installing the Website

In this section, we will:

- **Clone the website in Webflow** – We will copy the visible part of the website.
- **Clone the backend in Xano** – This will contain the structure the website needs to function and store its data.
- **Connect the website and the backend (Webflow + Xano)** – We will link the website with its backend structure, in order to work properly.

2.1. Cloning the Website – Webflow

First, let's clone the visible part of the website to your Webflow account. To do this, please follow the steps below.

1. **Click** on the following link to access the website template.

2. Click ***Clone in Webflow*** (Figure 17).
   Note: If you are not logged in, you will need to sign in to your Webflow account and click on the link again.

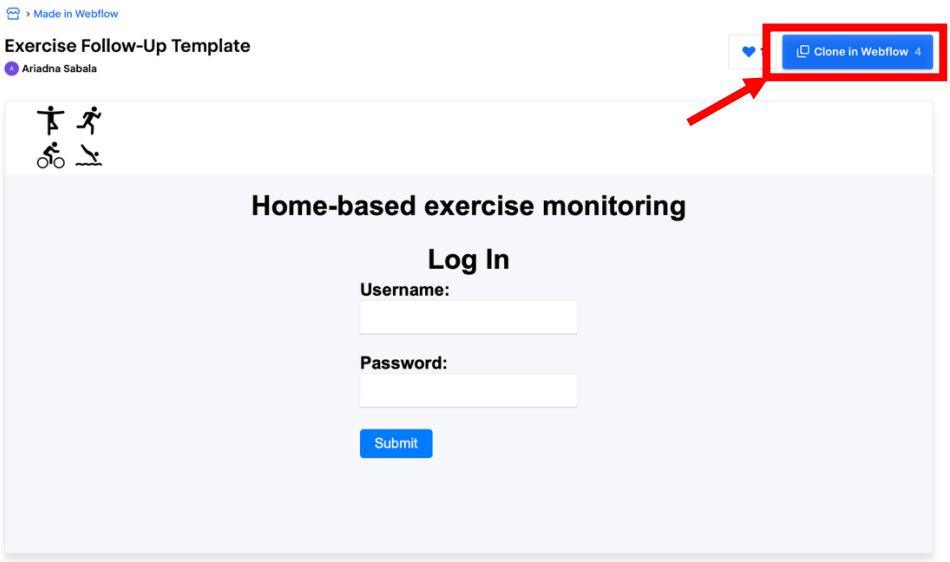

Figure 17. Template of the website

3. On the next page, click the ***Create site*** button.
   - **Enter the name of your website** (This is not a permanent name. If desired, it can be changed later).
   - Click ***Create site***.

   This will immediately create a copy of the website in your workspace.

Notes:

- ***If you have not verified your email*** *(Step 4 of 1.1. Creating a Webflow account), your original verification link has likely expired.*

- ***Then, to verify your email*** *and be able to clone the website, follow the next steps:*
  - *Log in to your Webflow account.*
  - *At the top of the screen, you will see a blue banner that says* ***'Take a moment to verify your email address by clicking inside the email we sent.'*** *Click* ***'Send Email Again'****.*
  - *Check your inbox for the new email. Verify it quickly before it expires again.*
  - *Once verified, the blue banner will no longer appear, and you will be able to clone the website.*

4. **Congrats! You have created a copy of the website in your workspace**.
   You should see something to Figure 18 - **keep this tab open**.
   This the website editor, which is used to make changes to the visual part of the website.

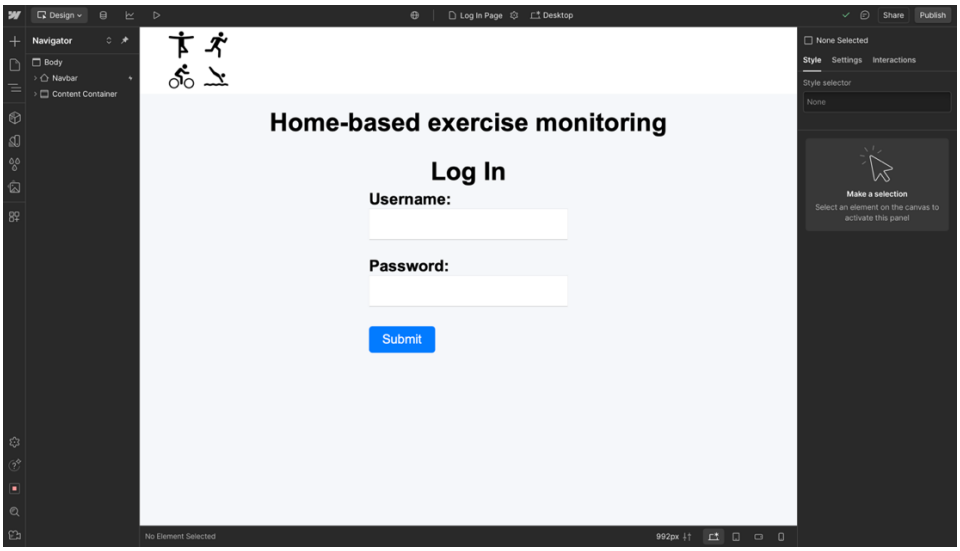

Figure 18. Copy of the website on your workspace

2.2. Cloning the Backend – Xano

Now, we will clone the backend of our website in Xano. To do so, please follow the steps below.

1. Click on this link to clone the backend.
   Note: Make sure to use ***Google Chrome*** *when accessing Xano.*

2. Click **'Add to your Xano Account'** (Figure 19).
   You will then be requested to **log in**; please do so.

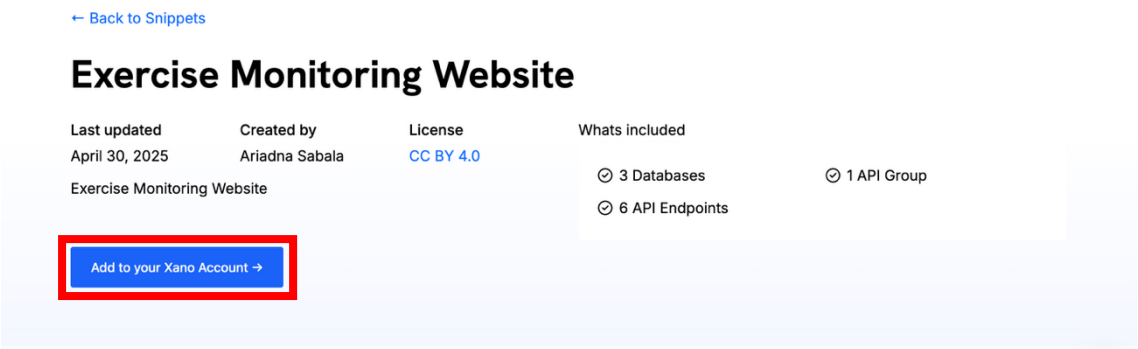

Figure 19. Template of the backend of the website

3. Click on **'Free instance'** (Figure 20).

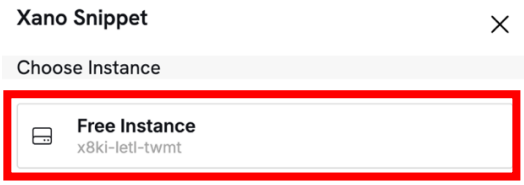

Figure 20. 'Free instance' on Xano

4. Then, click the **'Add to instance'** button in the bottom-right corner of the screen (Figure 21).

5. This may take a moment. Once done, a success message will appear. Click **'Go to instance'** (Figure 22).
    - You will be directed to your Xano workspace.

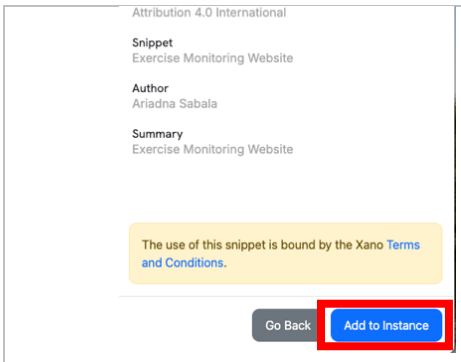

Figure 21. 'Add to instance' on Xano

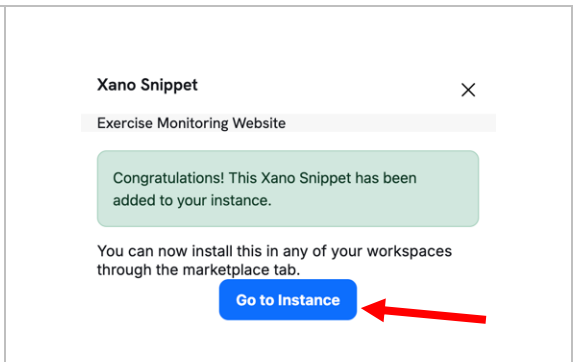

Figure 22. Success message on Xano

6. In the same Xano tab (you can close any other Xano tabs you have open), click ***Marketplace*** on the left side of the screen.

    - Different options will appear, click on ***Purchased*** (Figure 23).

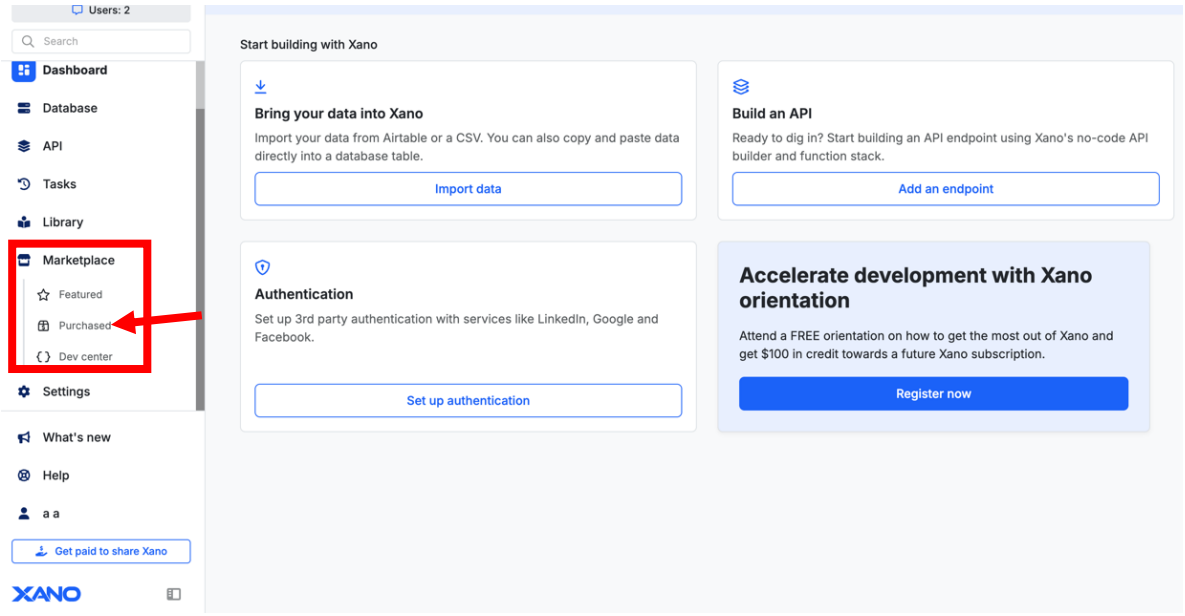

Figure 23. Xano's workspace

7. You are almost done! You should now see something like **Figure 24**.
   - **Click on it**.
   - Then, click ***Install Snippet***, on the right side of the screen (Figure 25).
   - Click the *Install* button again.

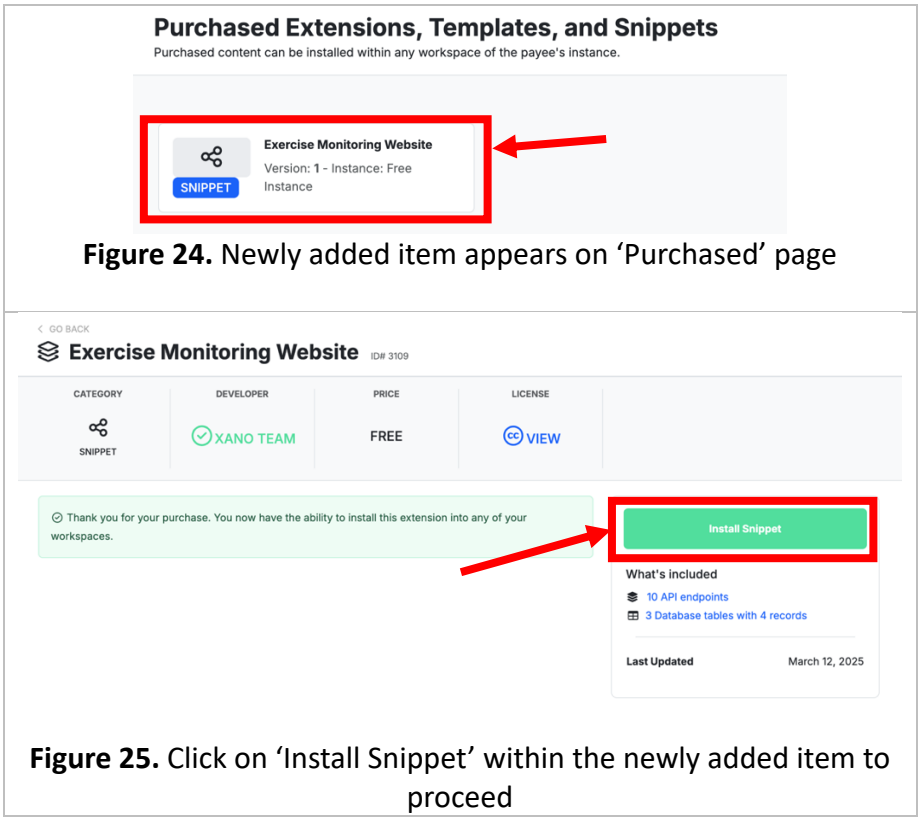

Figure 24. Newly added item appears on 'Purchased' page

Figure 25. Click on 'Install Snippet' within the newly added item to proceed

8. To verify that you have successfully cloned the backend:
   - Click **'API'** in the left menu.

- A folder named **'API Webflow website'** should appear (**Figure 26**). This folder contains some links that we will use later to connect Xano with Webflow.
    - If you do not see this folder, repeat Step 7.

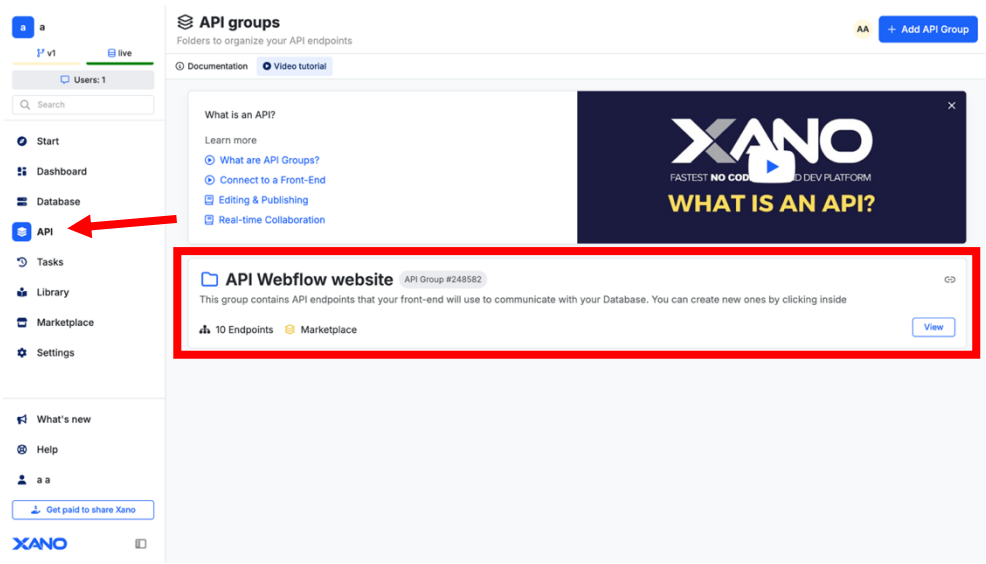

Figure 26. Folder 'API Webflow website' with website links in Xano

9. **Congrats!** You have successfully cloned the backend of the website.

2.3. Connecting the Website and Backend (Webflow + Xano)

In this step, we will connect your website (built in Webflow) to your database (in Xano) using special **links**. These links allow the website and the database to communicate with each other. This connection is what makes the website work properly.

***Important**: In this section, we will use a feature of Webflow that is available only with a paid plan. Follow the steps below to upgrade your Webflow account, then continue with the linking process. This is the only payment required throughout this manual and for the use of the website.*

Upgrading the website plan

1. In the Webflow tab where you have cloned the website:

    - Hover your mouse over the **'W' logo** in the top-left corner of the screen.

    - A **menu icon** (three horizontal lines) will appear, click it (Step 1 – Figure 27).

    - Click on ***Site settings*** (Step 2 - Figure 27).

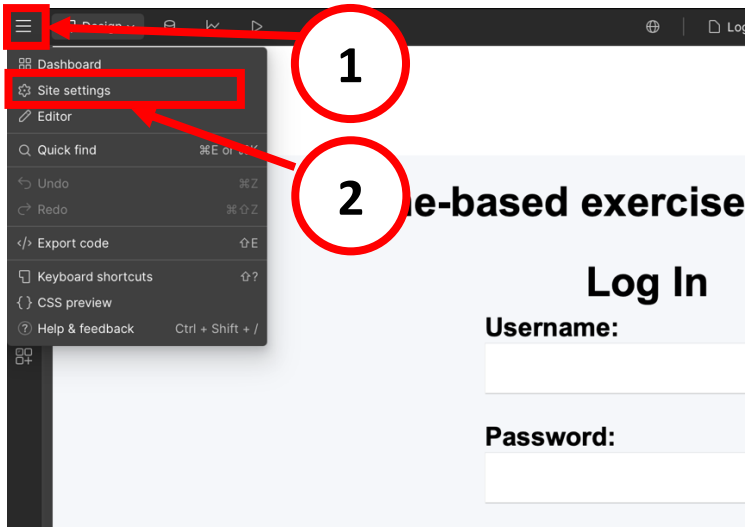

Figure 27. Accessing the Site settings from the website editor

2. Now, in the left menu, go to ***Plans*** **(Step 1- Figure 28)**.
   - The available plans for your website will appear.

   - Select the **'Basic'** plan by clicking on ***Upgrade to Basic*** **(Step 2 – Figure 28)**. *Upgrading to this plan is essential because it will allow us to access a section of Webflow that enables linking the website with Xano.*

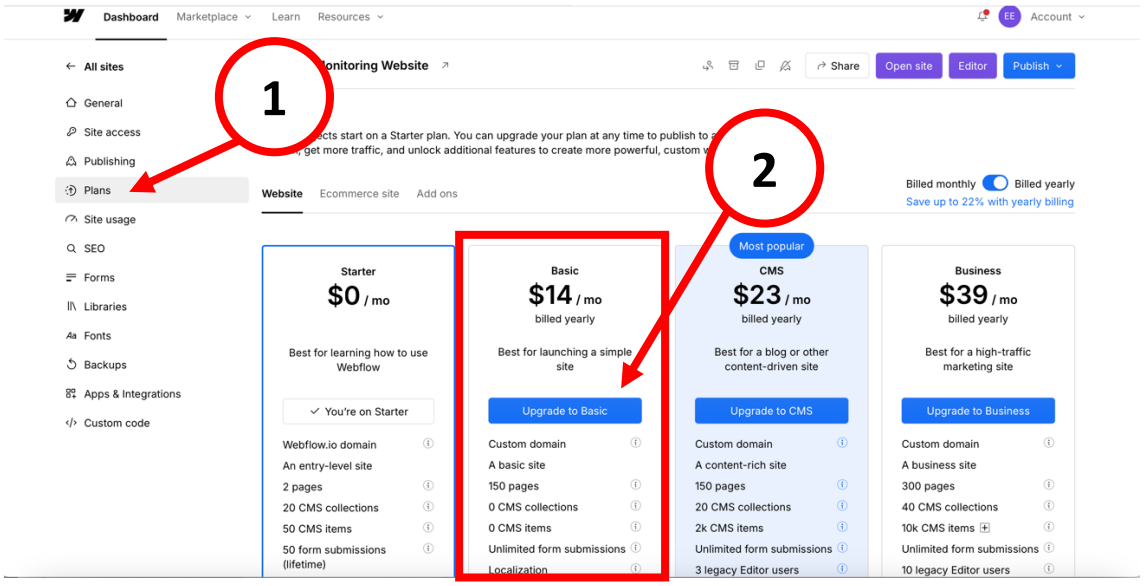

Figure 28. Upgrading the website's plan on Webflow

3. Follow the payment steps.
   Note: <u>You can choose to be billed monthly or yearly. We recommend opting for monthly billing initially</u>. Once confirmed that everything is working, as we will do later in this manual, you can switch to yearly billing, as it's more cost-effective in the long run.

Linking the Website with Xano

Now that you have upgraded the website, we can link it to Xano. Follow the seps below to complete the linking process.

As you follow the instructions, you will copy links from Xano and paste them into Webflow. You will repeat this process a few times. Once finished, Webflow and Xano will be fully connected and ready to work together.

Note: For this process, it is helpful to keep one tab open and logged into Xano (in Google Chrome) and another tab open and logged into Webflow.

1. Go to your **Xano** tab.
   Note: If you have accidentally closed the Xano tab, don't worry - Go to Xano, log in, and click on 'Free Instance' to get back where we were.

   - In the left-side menu, click ***API***.
   - Then, enter the folder **'API Webflow website'** (Figure X).
   - This is a folder we installed when cloning the backend and contains the 'special links' we will use to link in Webflow.

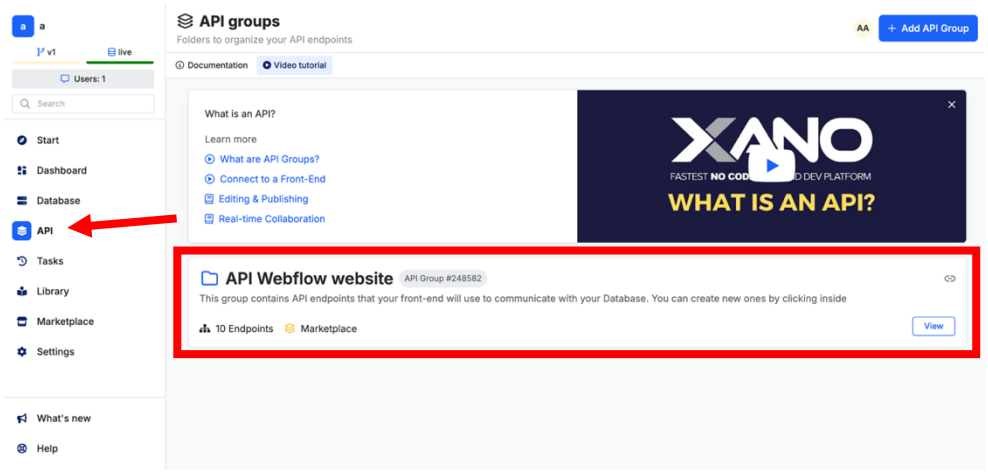

Figure 29. Folder 'API Webflow website' with website links in Xano

- Inside the folder, you will see something like Figure 30.

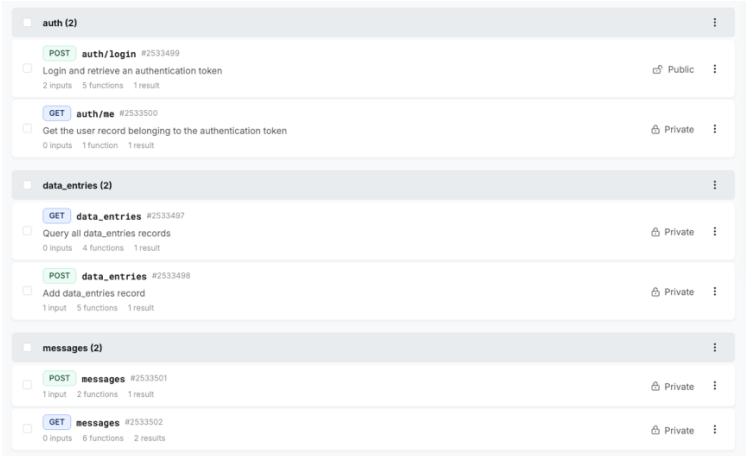

Figure 30. Inside the folder 'API Webflow website' in Xano

2. Inside the 'auth' section, you will see two subsections (Figure 31):
   - **POST auth/login**
   - **GET auth/me**

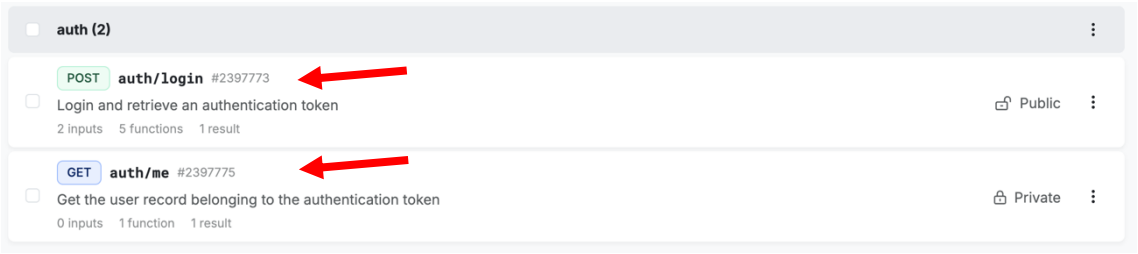

Figure 31. 'API Webflow website' folder in Xano - 'auth' section

3. Click on the ' ⋮ ' (three points) next to **POST auth/login (Figure 32)**.
   - Then, click ***Copy Endpoint Link*** **(Figure 32)**. This action copies the first link, which we will use in the next step to paste into Webflow.
   - This link will be one of the connections between Webflow and Xano.

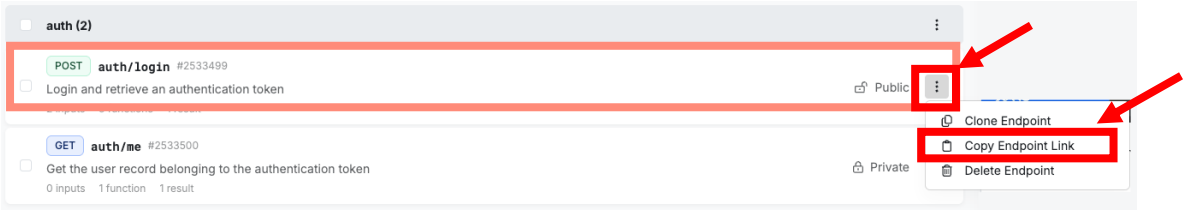

Figure 32. Clicking the three dots next to POST auth/login and 'Copy Endpoint Link'

4. Now, go your Webflow tab. Click on **'Open site'**, to open your cloned website.
   Note: If you have accidentally closed the Webflow tab, don't worry – Go to Webflow, log in, and click on 'Open site' to return to where we left off.

   - Make sure you are in ***Design*** **mode** by checking if **'Design'** appears in the top-left corner of the screen (**Figure 33**).
     - If it doesn't, click there and switch to **Design mode**.

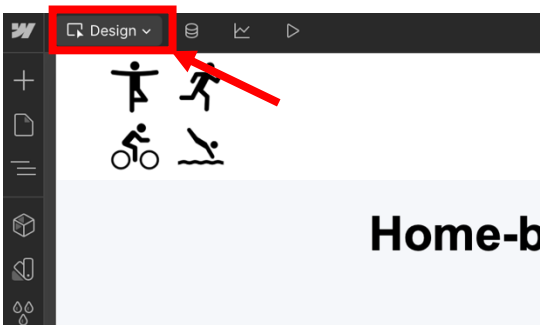

Figure 33. Verifying that you are in Design mode

- In the menu on the left-side of the screen:
  - Click on **'Pages' icon** (Step 1 – Figure 34).
  - The will open the Pages menu, which lets you navigate through the different pages of your website.
  - Find the **'Log In Page'** page and click the **' ⚙ ' icon next to it** (Step 2 – Figure 34)**.**

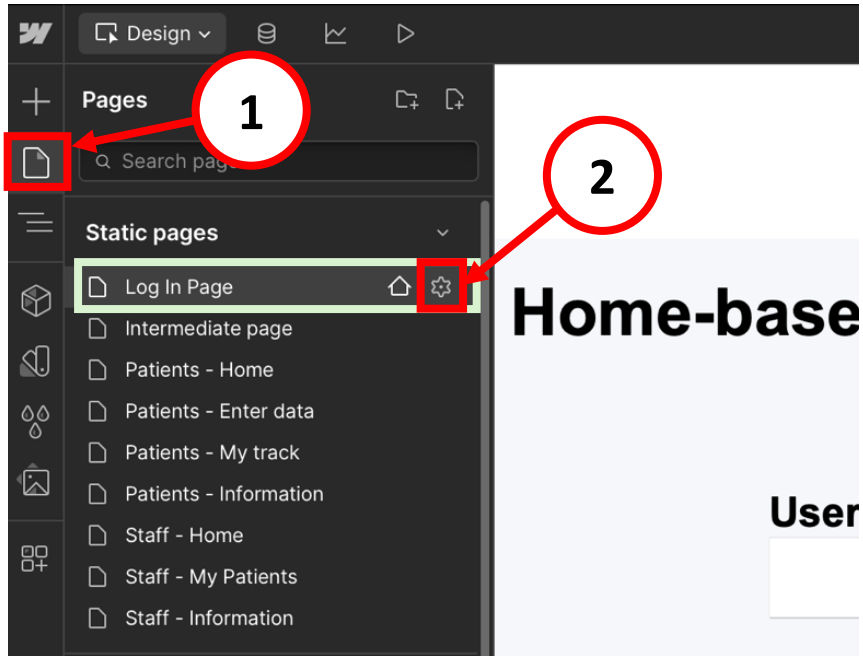

Figure 34. Navigate through your Webflow workspace to open and edit the 'Log In Page' settings.

- Scroll down until you see a section called **'Custom code' (Step 1 - Figure 35)**.
  - Don't worry, you will not need to work with any code!
  - You will see something similar to Figure 35.
  - You will notice the words 'name' and 'content' written in orange.
  - On the second line, next to 'content', **paste (Ctrl + V) the link** we have copied earlier **between the quotation marks (" ") (Step 2 - Figure 35)**:

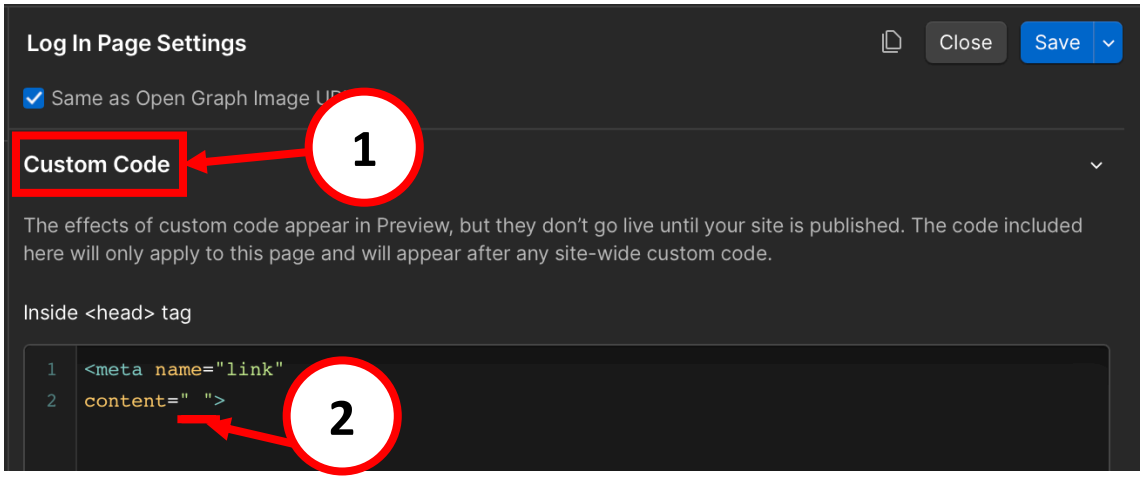

Figure 35. Location of the 'Custom code' section and the " " to place the link

- It should look similar to what is shown in **Step 1 - Figure 36**.

- Click ***Save*** on the top-right corner **(Step 2 - Figure 36)**

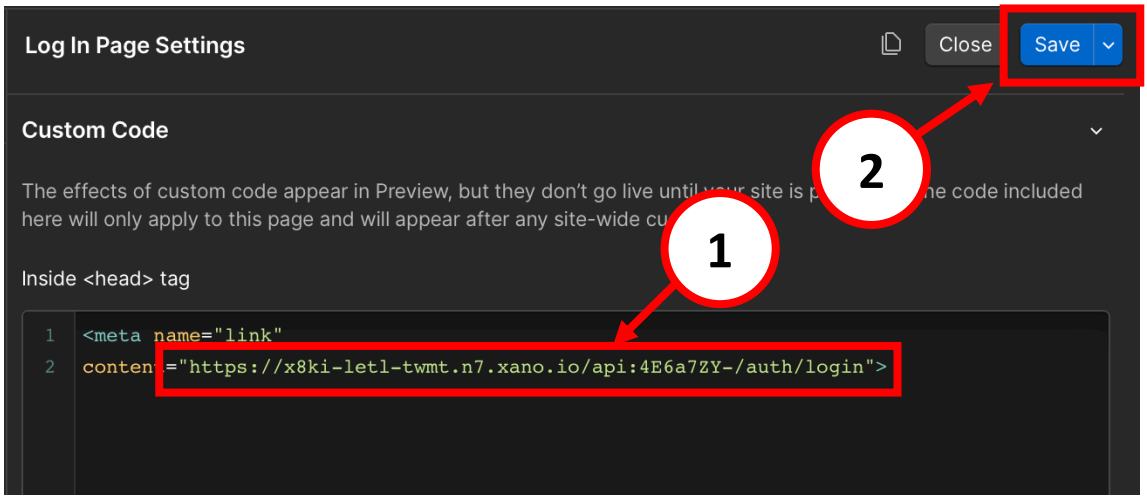

Figure 36. Correct placement of the link between the quotation marks

- **Great job!** You have successfully completed your first linking.

5. Now, let's repeat this process a few more times.
   - Go back to your Xano tab.
     - Click on the '⋮' (three points) next to **GET auth/me** (Figure 37).
     - Then, click ***Copy Endpoint Link*** (Figure 37), just like you did before. This action will copy the second link, which we will paste into Webflow in the next step.

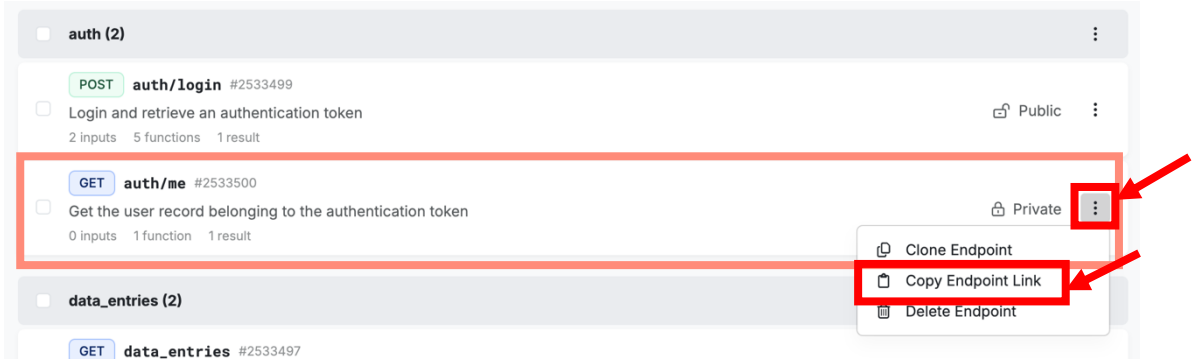

Figure 37. Clicking the three dots next to POST auth/me and 'Copy Endpoint Link'

- Go back to your Webflow tab.
  - Find the **'Intermediate Page'** page and click the **' ⚙ ' icon next to it.**
  - Scroll down and look for the **'Custom Code'** section.
  - As before, you will see the words 'name' and 'content' written in orange.
  - On the second line, next to 'content', **paste (Ctrl + V) the link** we just copied **between the quotation marks (" ")**.
  - Click ***Save*** in the top-right corner.

6. You are almost there! Let's repeat it one more time.
   6.1. Go back to your Xano tab.
   - This time, look for the **'data_entries' section** (Figure 38).

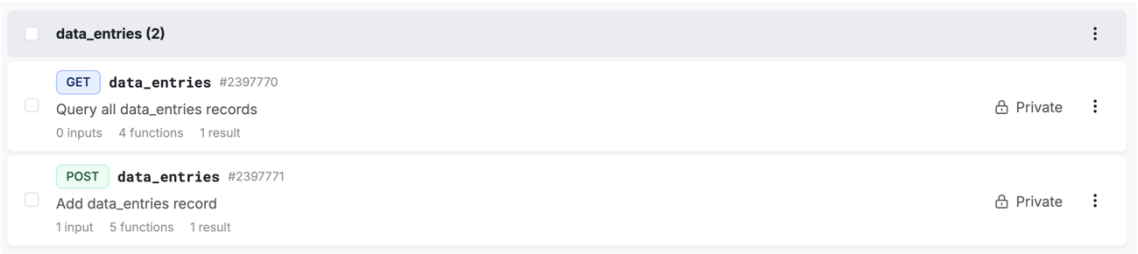

Figure 38. 'API Webflow website' folder in Xano - 'data_entries' section

   - Click on the '⋮' (three points) next to **GET data_entries** or **POST data_entries** (either option works).

   - Then, click ***Copy Endpoint Link***. This action will copy the third link, which we will paste into three different pages in Webflow in the next step.

   6.2. Go back to your Webflow tab. We will add this link in three pages.
      6.2.1. Find the **'Patients – Enter data'** page and click the **' ⚙ ' icon next to it.**
      - Scroll down and look for the **'Custom Code'** section.
      - As before, you will see the words 'name' and 'content' written in orange.
      - On the second line, next to 'content', **paste (Ctrl + V) the link** we copied **between the quotation marks (" ")**.
      - Click ***Save*** in the top-right corner.

      6.2.2. **Repeat Step 6.2.1 for the 'Patients – My track' page.**

      6.2.3. **Repeat Step 6.2.1 for the 'Staff – My patients' page.**

7. You're almost there – just one last link to go! Follow the steps below:

   7.1. Go back to your Xano tab.
   - This time, look for the **'messages' section** (Figure 39).

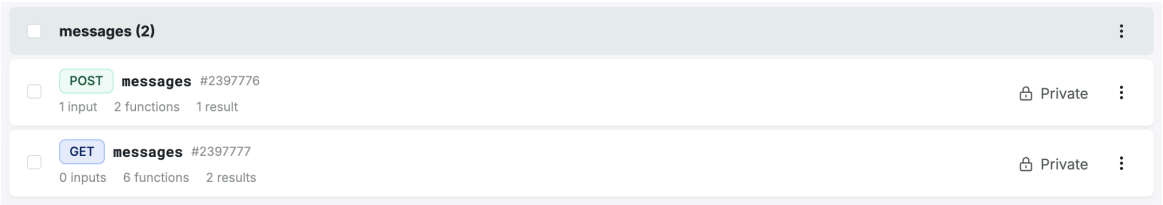

Figure 39. 'API Webflow website' folder in Xano - 'messages' section

- Click on the ‘ ⋮ ’ (three points) next to **POST messages** or **GET messages** (either option works).

- Then, click ***Copy Endpoint Link***. This action will copy the fourth and last link, which we will paste into two different pages in Webflow in the next step.

7.2. Go back to your Webflow tab.

7.2.1. Find the **‘Patients - Home’** page and click the **‘ ⚙ ’ icon next to it.**

- Scroll down and look for the **‘Custom Code’** section.
- As before, you will see the words ‘name’ and ‘content’ written in orange.
- On the second line, next to ‘content’, **paste (Ctrl + V) the link** we copied **between the quotation marks (“ ”)**.
- Click ***Save*** in the top-right corner.

7.2.2. **Repeat Step 7.2.1 for the ‘Staff – Home’ page.**

8. All set! Your website is now connected to Xano.

Note: If throughout these Steps at any point you do not find the ‘Custom code’ section, make sure you are in Design mode, as mentioned in Step 4. If you are not in Design mode, you will not be able to see this section.

3. Setting Up the Website's Address

To configure the website's address, there are two options:

- Option A: Use a free Webflow address (recommended for begginers)
- Option B: Buy a custom domain

In this section, follow either Option A or Option B. **We recommend following Option A if you are new to website development.** If you decide to switch to a custom domain later (Option B), you will be able do so at any time.

Option A: Use a free Webflow address

The free Webflow website address looks like this: https://xxx.webflow.io/
You can change the "xxx" to any name you prefer.

1. Hover your mouse over the **'W' logo** in the top-left corner of the screen (Figure 40).

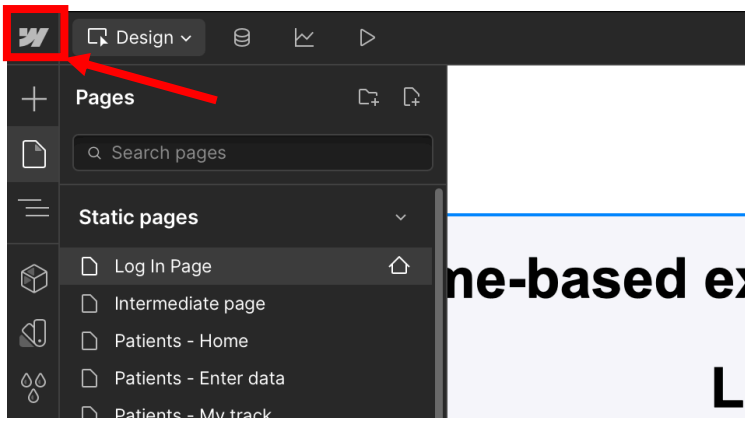

Figure 40. Accessing the Site settings from the website editor

2. A **menu icon** (three horizontal lines) will appear, click it (Step 1 – Figure 41).

3. Click on ***Site settings*** (Step 2 - Figure 41).

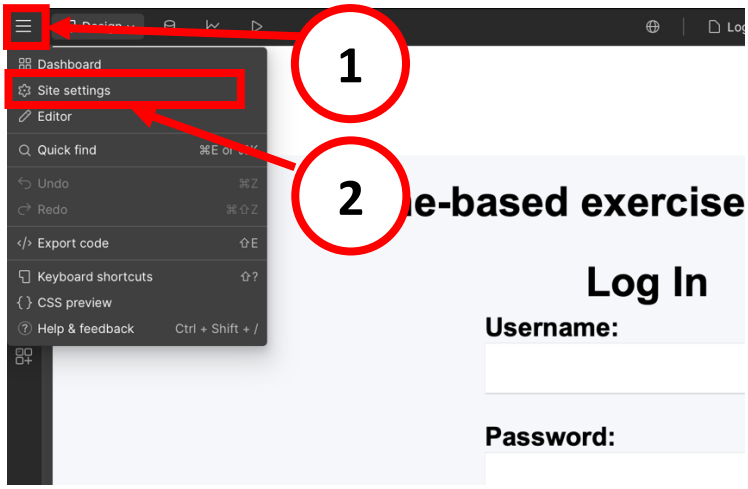

Figure 41. Accessing the Site settings from the website editor

4. Then, in the left menu go to ***Publishing*** (Step 1 – Figure 42).

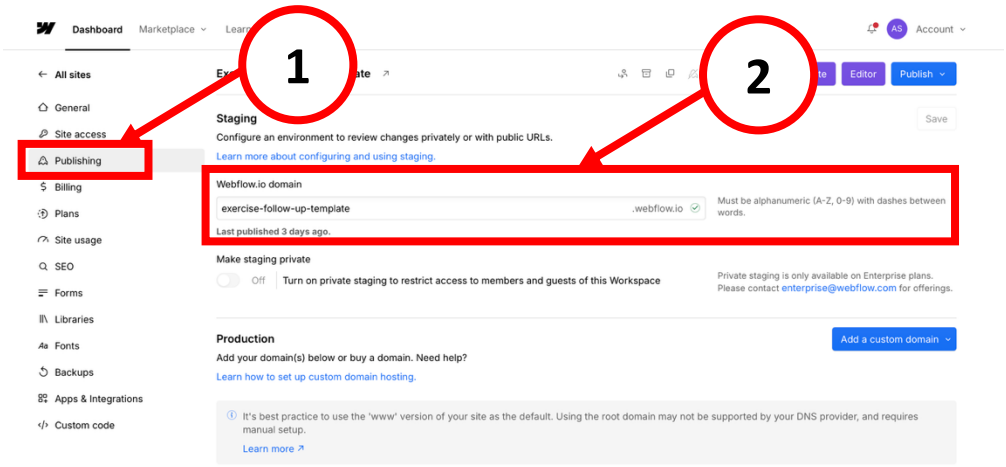

Figure 42. 'Publishing' section in Site settings

5. **Edit the text box** under 'Webflow.io domain' (**Step 2 – Figure 42**).
   - Enter the name you want for your website.
   - You don't need to type ".webflow.io", it is added automatically.
   - For example, in our case, in the text box contains: exercise-follow-up-template

     This means that the website address is:
     https://exercise-follow-up-template.webflow.io/

6. After editing the name, click ***Save*** (top-right corner of the screen).

Option B: Buy a custom domain

If you prefer that your website has different domain, like '.com', '.org', or others, you can buy a custom domain and connect it to your Webflow site.

For more information on how to do this, see this link.

4. Publishing the Website

In this section, we will publish the website to make it available online. Once the website is published, anyone with the link will be able to access it.

Also, whenever you make changes to the website in Webflow, you will use the publish option again to make the changes visible on the live website.

Follow the steps below to publish the website:

1. In Webflow, click ***Open site*** to open your website.

2. Click the **'Publish' button** in the top-right corner of the screen (Figure 43).

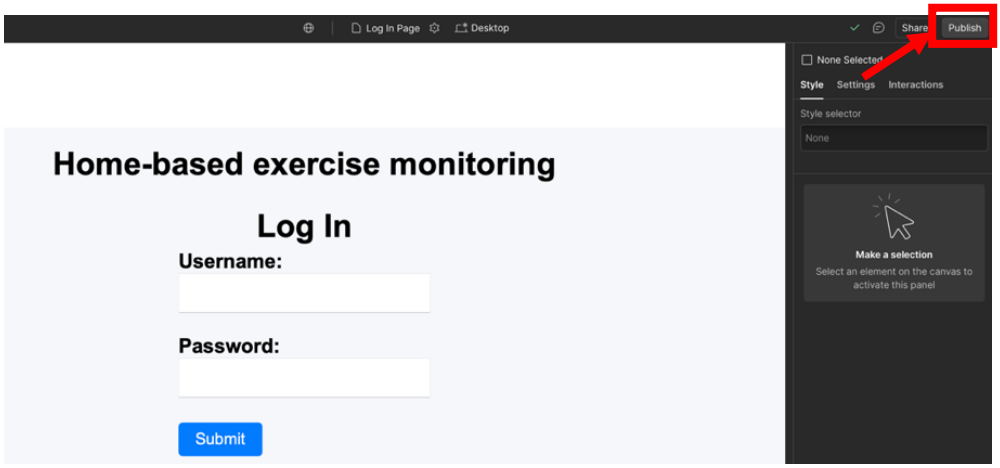

Figure 43. Location of 'Publish' button inside the Webflow's site

3. Click ***Publish to selected domains*** **(Figure 44)** and wait until it is published. Your website is now online!
   - If you followed Option B in the last section: select *Custom domain* and then click *Publish*.

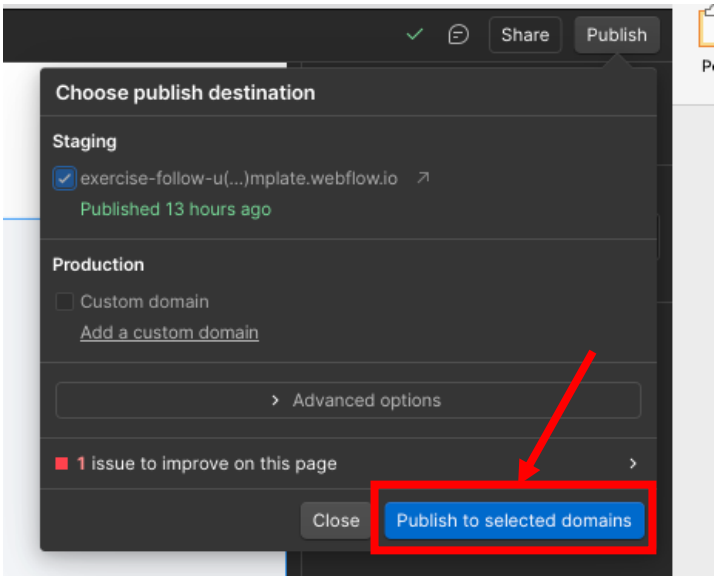

Figure 44. Clicking 'Publish to selected domains' to publish the website.

4. **To access the online website, click the '↗' (arrow) icon** next to the link (Figure 45).

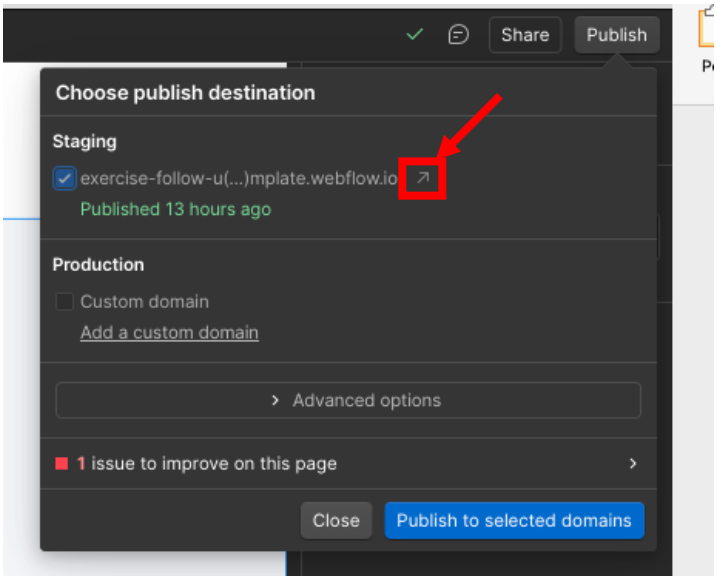

Figure 45. Location of the arrow icon to access the webpage

Note: The link of your site is the link of the newly opened tab, when you are on the log in page (Figure 46).

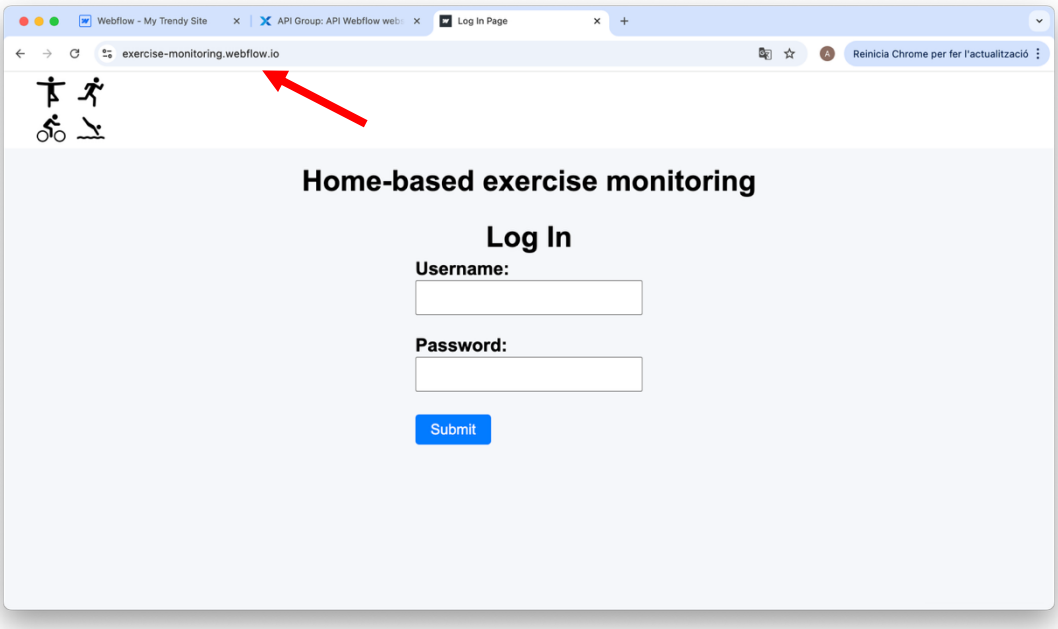

Figure 46. Login page of the website

You will notice that you cannot access the different pages of the website because you do not have a username or password. In the next section, we will learn how to create them.

5. Creating User Profiles

You will notice that on the published website, you cannot access inside the website because you do not have a username or password yet. Let's fix that! In this section, we will go over how to create user profiles.

1. Go to **Xano**.

2. Click ***Database*** **(Step 1 – Figure 47)** in the left menu.
   Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

3. Click on the '**user'** table **(Step 2 – Figure 47)**.
   This table will contain all the users that can log into our website.

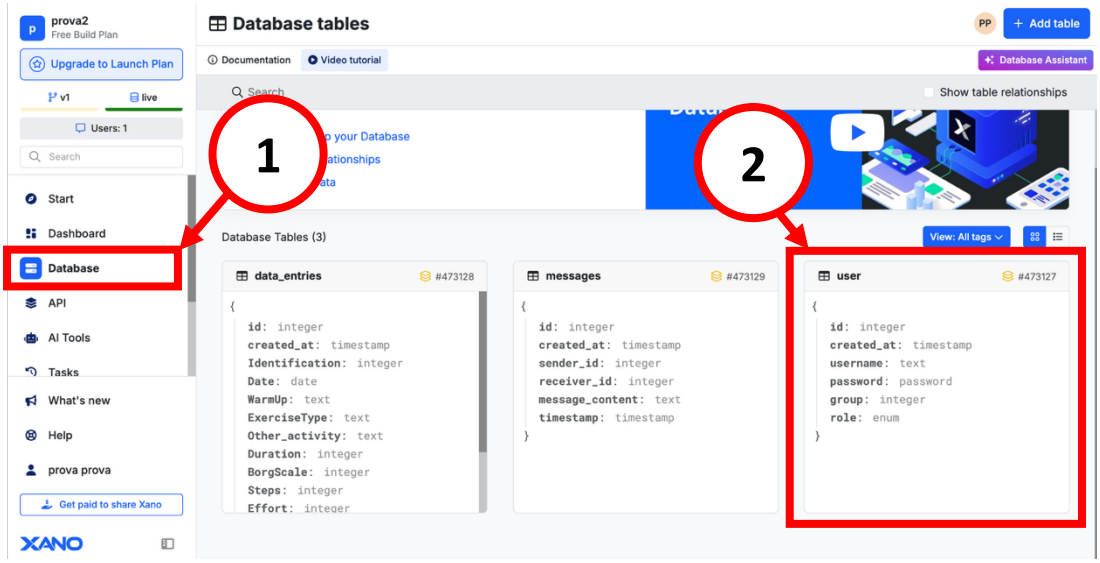

Figure 47. Location of the steps to follow to access the *user* table

4. To create a new user, click **'Add new record' (Step 1 – Figure 48)**.

5. Then, fill following fields **(Step 2 - Figure 48)**:

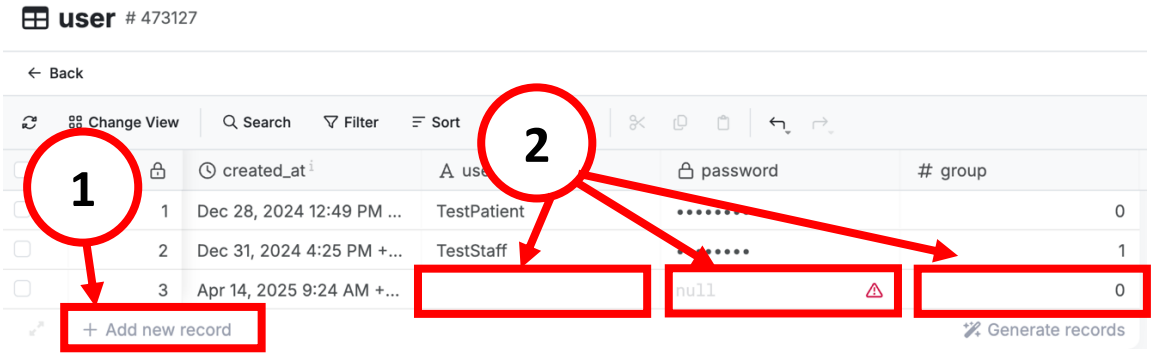

Figure 48. Adding a new record to the 'user' table

- ***username***: Enter the desired username for the profile.

  Note: Avoid using names that indicate whether the user is staff or a patient, or any personal information (See more in section 7. Security Best Practices).
  - *Example of what **not** to use: '1234staff' → This reveals the user is a 'staff' member*
  - *Example of a **better choice**: 'aw156' → This is a non-identifiable username.*

- ***password***: Set a password for the user.
  To create a strong password, it should include:
  - At least **8 characters**
  - At least **1 number**
  - At least **1 symbol**
  - At least **1 lowercase letter**
  - At least **1 uppercase letter**

  The password cannot include accented characters.

  Note: Make sure to write it down somewhere. If you forget it, you will not be able to view the password later; you will only be able to change it.

- **'group'**: By default, a '0' will appear on this field. Click on it and **update the value based on the type of user**:
  - Enter '**0**' if the user is a **patient**
  - Enter '**1**' if the user is **staff**

6. We recommend that you **try logging in on your website with the username and password** you just created to ensure they work.
   - The published website is the one we accessed in last step of the last section.
   - If you cannot log in, don't worry, as we will verify the this later in section *6.1. Verifying Login Functionality*

7. Congrats! You have successfully created new user profiles for your website.

Test Users

The '**user'** table in Xano initially contains two users. These are their usernames:
- TestPatient
- TestStaff

These users will be useful for testing purposes throughout this manual. Update their passwords: **Double-click on the password field and set a password** you will remember, as we will use these users later in Section *6. Verifying Website Functionality* .

What to Do if a User Forgets Their Password

If a user forgets their password, you will need to change it to a new one in Xano:

1. Go to **Xano**.
2. In the left menu, go to **'Database'**.
   Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.
3. Open the **'user'** table.
4. Find the username of the User in the table.
5. Then, **double-click its password** field and **enter a new password**.
6. Give the new password to the user.

How to Find the Username–ID Patient Equivalence

As a staff member, you will not see the patient's name or username directly on the website, you will see their **ID**.

So, how can you find the equivalence between a patient's username and their ID?

1. Go to **Xano**.
2. In the left menu, go to **'Database'**.
   Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.
3. Open the **'user'** table.
4. **Locate the username** of the patient **(Step 1 – Figure 49)**
5. **Find the corresponding number in the 'id' column (Step 2 – Figure 49)**.
   This number represents the patient's ID.

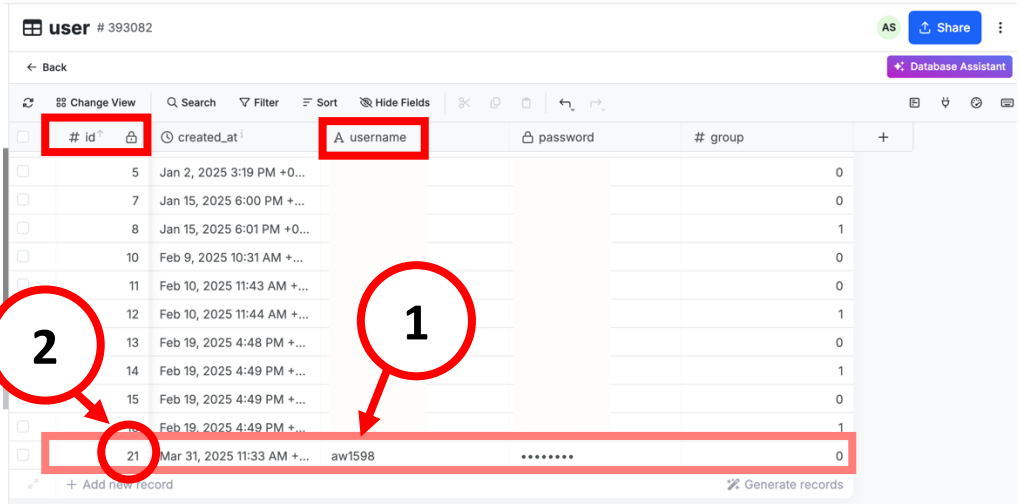

Figure 49. Identifying a patient's ID in the Xano database.

Note: We recommend maintaining a separate document with a table containing the ID, patient usernames, and their corresponding names. This will save time and prevent the need to check Xano repeatedly. For example:

Name	ID	Username
George	21	aw1598
…	…	…

6. Verifying Website Functionality

In this section, we will **verify that all website functionalities are working** properly.

To do this, **we will use the 'test patient' user profile and the 'test staff' user profile** mentioned in the last section. For more details, refer to the *Test Users* section.

6.1. Verifying Login Functionality

Go to the link of your published website and log in using the username and password of the 'test patient'. Can you log in?

- **If yes:**
  You should see something like **Figure 50**. This means the login functionality is working properly. **Skip to section *6.2. Verifying Messaging Functionality***.

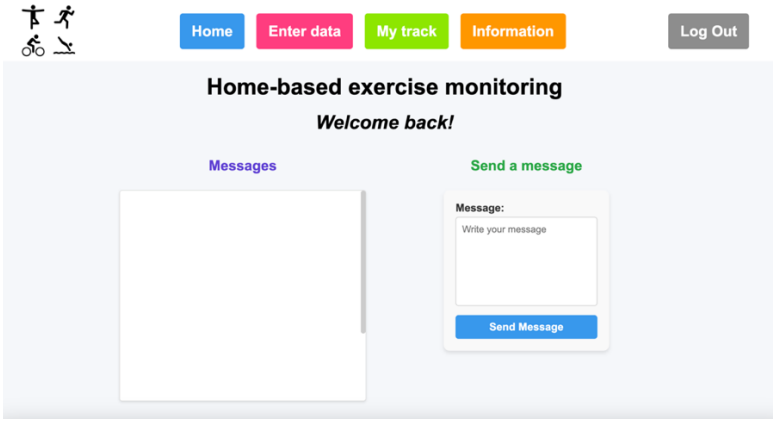

Figure 50. Home page of a newly logged-in user

- **If yes but stuck on an intermediate page (like Figure 51)**:
  This suggests that ***Step 5 in Linking the Website with Xano*** may not have been completed correctly.
  - **Repeat** Step 5.
  - Then, **publish** the website to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
  - **Refresh** the website and **attempt to log in again**.

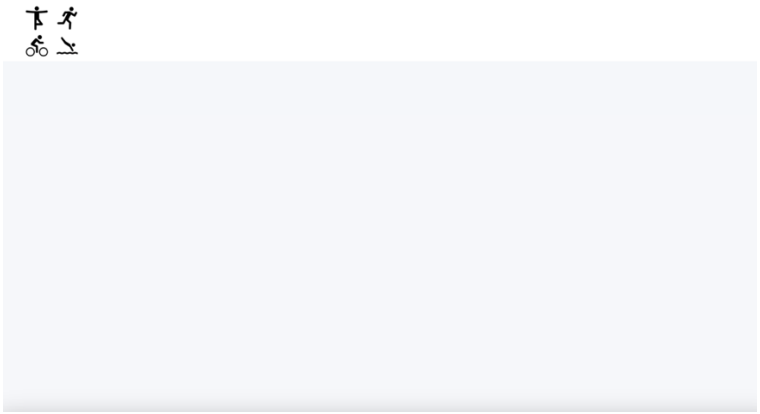

Figure 51. Intermediate page (incomplete log in functionality)

- **If no:**

    - And a **banner** appears on your screen that says **'Invalid username or password'** **(Figure 52)**:
      This means that you are either introducing the wrong username or password.
      Please revisit section ***5. Creating User Profiles*** and make sure you are entering the right username and password.

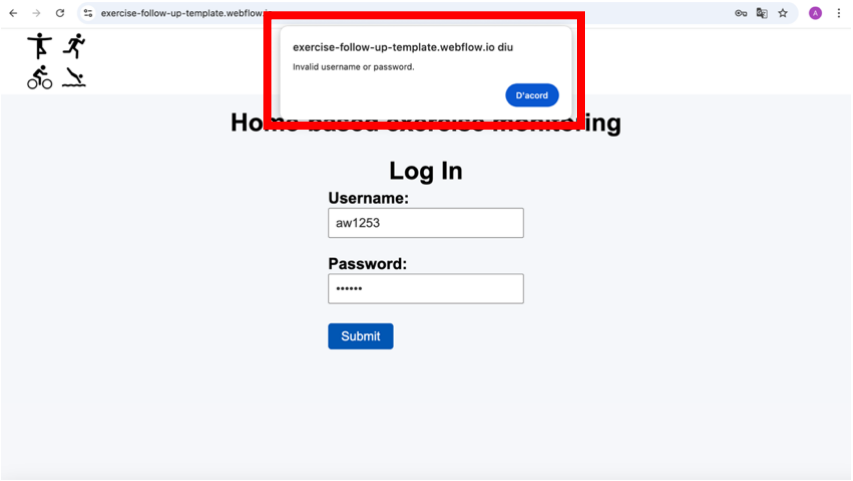

Figure 52. Screenshot of banner 'Invalid username or password'

    - If **no banner appears** when clicking the 'submit' button but you are still unable to log in:
      This indicates that the ***Steps 3 and 4 in 'Linking the Website with Xano'*** may not have been completed correctly.
        - **Repeat these steps** (Steps 3 and 4)
        - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
        - **Refresh** the website and **attempt to log in again**.

6.2. Verifying Messaging Functionality

Now, we are going to verify the messaging functionality for patients and for staff.

Verify Messaging for a Patient User

1. **Log in** using the username and password of the **test patient** user profile.

2. In the Home page, **try writing a message** in the message box **and sending it** (Figure 53):

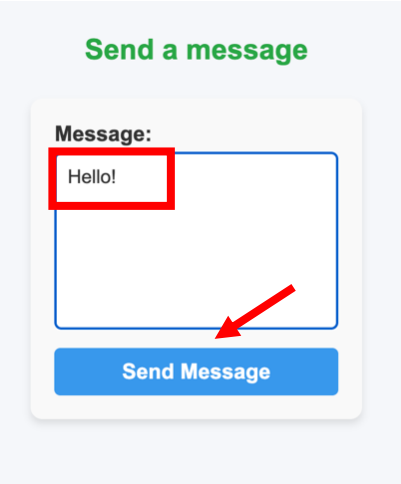

Figure 53. Sending a message in the message box

- **If the message appears in the left message inbox (Figure 54)**:
  The messaging functionality for patients is working properly. **Skip to section** ***Verifying Messaging for a Staff User***.

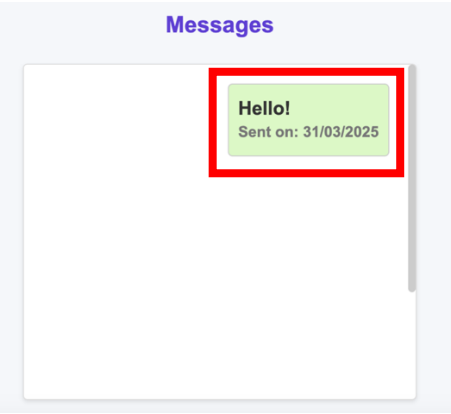

Figure 54. Sent message appearing in the message inbox

- **If the message does not appear:**
  This indicates that the ***Steps 7.1 and 7.2.1 in 'Linking the Website with Xano'*** section may not have been completed correctly.
  - **Repeat these steps** (Steps 7.1 to 7.2.1)
  - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
  - **Refresh** the website and **try sending a message again**.

Verify Messaging for a Staff User

1. Log out of the **test patient** user profile.

2. Log in using the **test staff** user profile.

- **If the message sent by the test patient in the previous section appears (Figure 55):**
  Great! This confirms that staff users can properly receive and send messages to and from patients. **Skip to section** ***6.3. Verifying Data Submission and Visualization*****.**

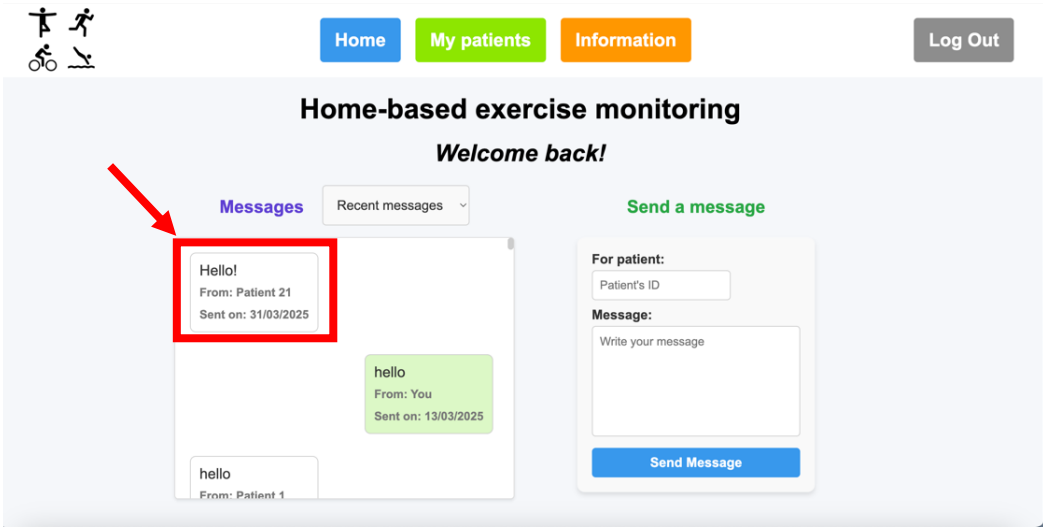

Figure 55. Home page of a logged-in staff user displaying the message received

- **If the message sent by the test patient in the previous section does not appear (Figure 56):**
  This suggest that ***Steps 7.1 and 7.2.2 in 'Linking the Website with Xano section'*** may not have been completed correctly.
  - **Repeat the steps** (***Steps 7.1 and 7.2.2***)
  - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
  - **Refresh** the website and **check if the message appears**.

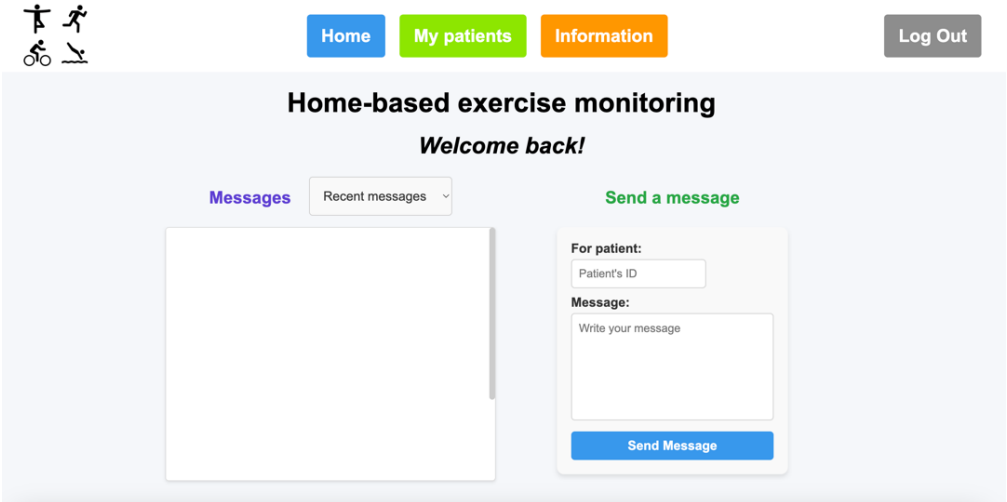

Figure 56. Home page of a logged-in staff user with no messages displayed

6.3. Verifying Data Submission and Visualization

Finally, let's verify that the data submission and visualization works.

Verifying Data Submission and Visualization for a Patient User

1. Log out of the **test staff** user profile.
2. Log in using the **test patient** user profile.
3. **Click 'Enter data'** in the top menu to navigate to the data entry page.
4. Fill out the form as you want and click 'Send data' (Figure 57).

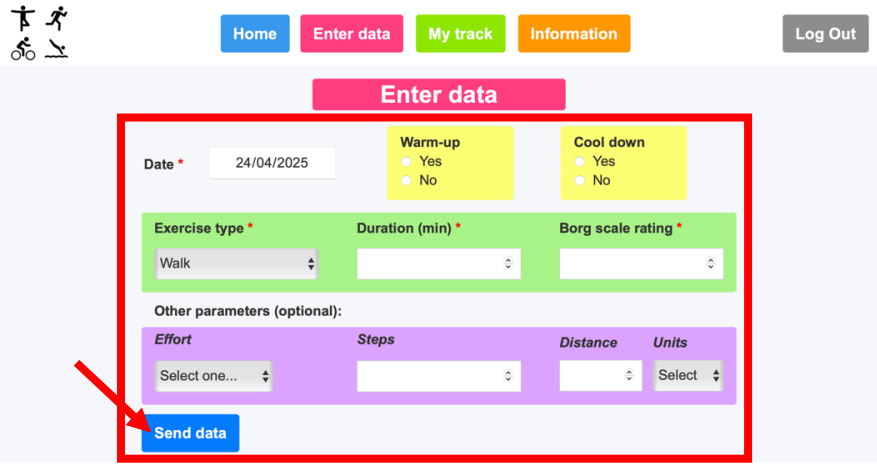

Figure 57. Filling out the form on the 'Enter data' page

- **If the form is submitted successfully (Figure 58):**
  This means that the data submission is working properly. Go to Step 5.

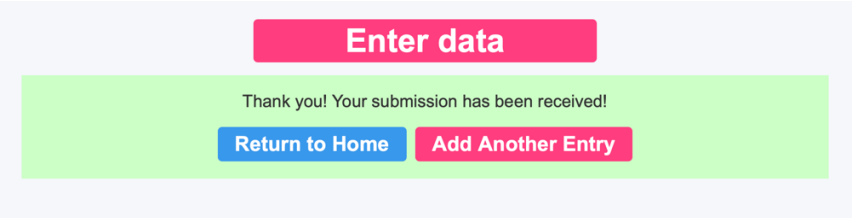

Figure 58. Confirmation page after successfully submitting a form

- **If the form is not submitted (error message like in Figure 59):**
  You will see an **error message** like in **Figure 59**.
  This indicates that the ***Steps 6.1 and 6.2.1 in 'Linking the Website with Xano'*** section may not have been completed correctly.
  - **Repeat these steps** (Steps 6.1 and 6.2.1)
  - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
  - **Refresh** the website and **try submitting the form again**.

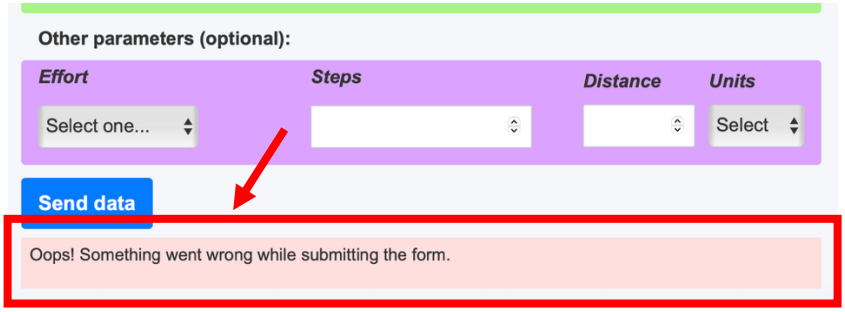

Figure 59. Error message displayed when there is an issue with data submission functionality

5. Now, go to **'My track'** page (by clicking the button in the top menu).

6. **Check if the data entry submitted** before **appears** on the screen.

   - **If yes (Figure 60):**
     Perfect! This confirms that patients can properly enter and visualize their data. **Go to section** ***Verifying Data Visualization for a Staff User***.

   - **If not (Figure 61):**
     This indicates that the Steps 6.1 and 6.2.2 in ***'Linking the Website with Xano'*** section may not have been completed correctly.
     - **Repeat these steps** (Steps 6.1 and 6.2.2)
     - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
     - **Refresh** the website and **try visualizing the data again**.

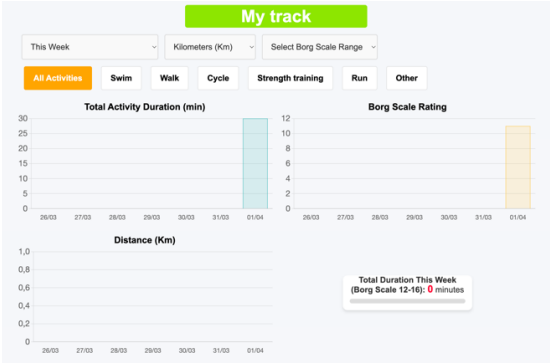

Figure 60. Example of a submitted data entry displayed on the 'My Track' page

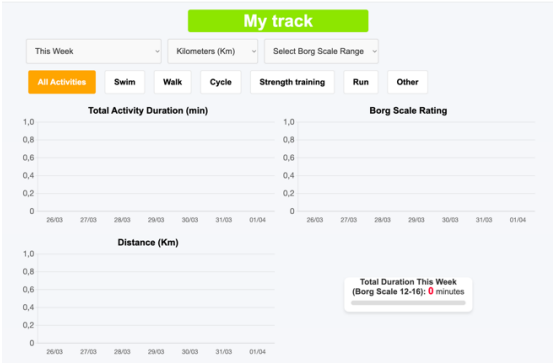

Figure 61. 'My Track' page with no entries displayed

Verifying Data Visualization for a Staff User

1. Log out of the **test patient** user profile.

2. Log in using the **test staff** user profile.

3. **Click 'My patients'** in the top menu, to navigate to the page where the data entries of the patients appear.

4. In the **'Select a patient' dropdown**, select the patient with the **ID** corresponding to the **test patient user** (See ***How to Find the Username–ID Patient Equivalence***)

5. Check if the data entry you submitted earlier by the patient profile appears on the screen:

   - **If yes:**
     Great! This means staff users can properly view patient data entries.

   - **If not:**
     This suggests that the Steps 6.1. and 6.2.3 in ***'Linking the Website with Xano'*** section may not have been completed correctly.
     - **Repeat these step** (Step 6.1 and 6.2.3)
     - Then, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).
     - **Refresh** the website and **try visualizing the data again**.

7. Security Best Practices

No personal or clinical data related to the patient's health is introduced into the website, only anonymous data on daily exercise.

However, there are still some measures you should follow to protect user information.

As mentioned in the ***5. Creating User Profiles*** section, the usernames and passwords should meet the following guidelines:

- Usernames:
  - Do not include personal information.
  - Do not reveal whiter the username belongs to a patient or a staff member.
  - Use random combinations of letters and numbers.

- Passwords:
  To create strong passwords, they should include:
  - At least **8 characters**
  - At least **1 number**
  - At least **1 symbol**
  - At least **1 lowercase letter**
  - At least **1 uppercase letter**

Additionally, the document linking each patient to their ID and username, as recommended in section ***How to Find the Username–ID Patient Equivalence*** should be kept in a private file. It can be stored on a local computer (not in the cloud) or as physical copy outside any computer.

As for data stored in Xano, periodic reviews should be conducted to ensure that patient information that is no longer needed is not stored online. To learn how to delete a user's data, refer to section ***6. Deleting a User's Data*** in the **Annex**.

Website Template Customization

Before proceeding with the customisation of the website template, you must have completed all the sections within *Webflow Template Implementation*.

This section contains two examples to help you learn how to customize the website template:

- **Example 1:**
  In this example, we will **keep the website for physical rehabilitation monitoring**, and we will apply some changes:
  - Change the website's logo
  - Remove the option for patients to send messages
  - Modify and add activity types in the *Exercise Type* dropdown (on the *Enter data* page)
  - Delete the existing information documents and add new ones

- **Example 2:**
  In this example, we will modify the template and turn it into a **patient behaviour and wellbeing monitoring site**, where we will track:
  - Objective behaviours: medication compliance, sleep time, exercise duration, smoking, alcohol drinking, and eating
  - Subjective perceptions: sleep quality, exercise effort and general wellbeing

  Additionally, we will:
  - Change the website's logo
  - Change and add new information documents

Choose the example that best suits your needs and follow it.
For additional modifications, you can refer to the sections in the Annex.

Example 1: Adapting the Physical Rehabilitation Monitoring Template *(30min – 45min)*

As mentioned before, in this example we will:

- Change the website's logo
- Remove the option for patients to send messages
- Modify and add activity types in the *Exercise Type* dropdown (on the *Enter data* page)
- Delete information documents and add new ones.

*Note: Every time you open your website in Webflow (Figure 62), it is important to make sure you are in **'Design' mode**, to be able to modify the website.*

- *To check it, look if **'Design'** appears in the top-left corner of the screen (Figure 63).*
- *If it doesn't, click there and switch to **'Design' mode**.*

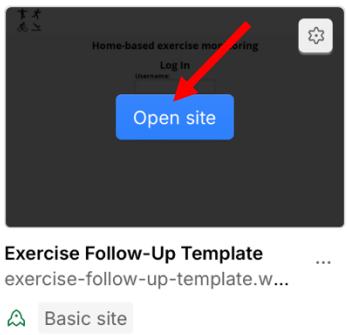

Figure 62. Opening the website

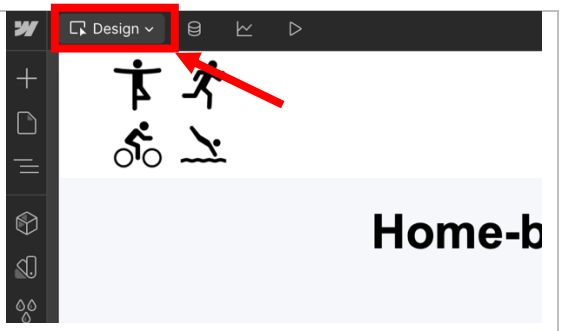

Figure 63. Verifying that you are in Design mode

1. *Changing the website's logo*

1. **Choose the logo image** you would like to use and save it in your computer.

2. Next, follow all the steps in section ***1. Changing the website's logo*** in the **Annex**.

3. Once you have completed the steps, you will have successfully updated the logo of the website with your chosen image.

2. *Restricting patients from sending messages*

1. This will prevent patients from sending messages, while still allowing staff to send them messages.

2. To apply it, follow all the steps in section ***3.1. Restricting patients from sending messages***.

3. *Modifying the Exercise Type dropdown*

1. Add the option **'Dance' (or another activity)** to the Exercise Type dropdown on the 'Enter data' page (patient view).

2. To do so, follow the steps in section ***Editing Exercise Type Options***.

3. If you also want to delete some of the existing activities, you can learn how to do so in the same section.

4. ***Managing information documents***
   1. The website has two 'Information' pages:
      - One that only patients can see: ***Patients – Information*** page
      - And one that only staff members can see: ***Staff – Information*** page
   2. To view the information documents available for patients, log into the published website as a patient and click on the documents on the *Information* page.
      You can do the same with a test staff user to view their documents.
   3. Now, follow the steps in steps in section ***How to delete a document, image, link or video*** to delete an information document.
   4. Perfect! Now, let's add a new one. **Choose an information document, image, link or video** you would like to add to the website.
   5. **Decide** whether you want to add the document to the patient information page, the staff information page, or both.
   6. If you want to add it to:
      - The patient information page:
        - Follow the steps in section ***How to add a document, image, link or video*** and, in Step 2, click ***Patients – Information*** page.
      - The staff information page:
        - Follow the steps in section ***How to add a document, image, link or video*** and, in Step 2, click ***Staff – Information*** page.
      - Both pages:
        - Follow the steps in section ***How to add a document, image, link or video*** **twice**:
          - First time: In Step 2, click ***Patients – Information*** page.
          - Second time: In Step 2, click ***Staff – Information*** page.

Once you have followed these steps, you will have successfully adapted the physical rehabilitation monitoring website.

Example 2: Modifying the Website for Patient Behaviour and Wellbeing Monitoring *(1h 15min – 1h 30min)*

In this example we will modify the website and convert it into a patient behaviour and wellbeing monitoring website. To do so, we will make the following modifications:

- Change the website's logo
- Change the form in the 'Enter data' page
- Adapt the graphs in the 'My track' page (patient's view) and 'My patients' page (staff view)
- Delete information documents and add new ones.

The new 'Enter data' form will look like Figure 64.

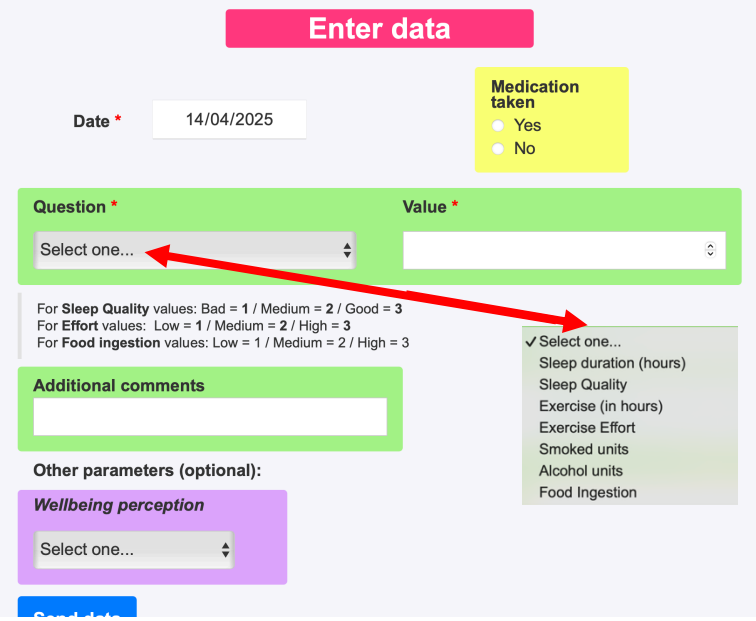

Figure 64. 'Enter data' form on the wellbeing monitoring website

Pages with graphs (the 'My track' page for patients and the 'My patients' page for staff) will look like Figure 65.

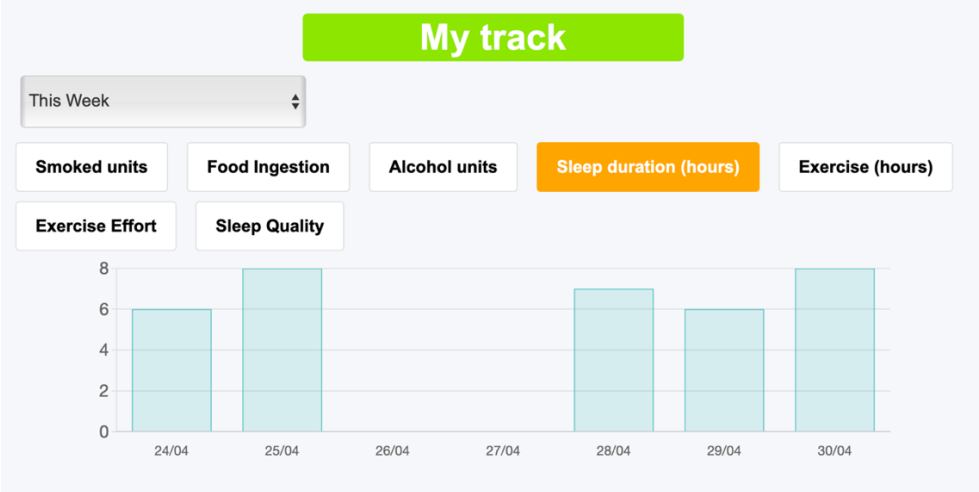

Figure 65. 'My track' page on the wellbeing monitoring website

*Note: Every time you open your website in Webflow (Figure 66), it is important to make sure you are in **'Design' mode**, to be able to modify the website.*

- *To check it, look if **'Design'** appears in the top-left corner of the screen (Figure 67).*
- *If it doesn't, click there and switch to **'Design' mode**.*

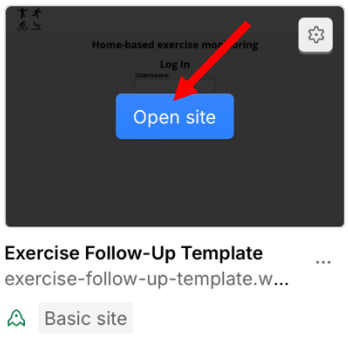

Figure 66. Opening the website

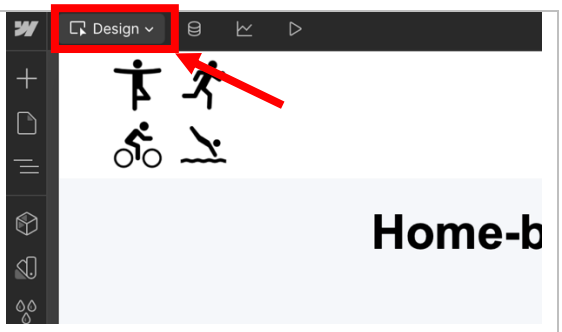

Figure 67. Verifying that you are in Design mode

1. ***Changing the website's logo***
   1. **Choose the logo image** you would like to use and save it in your computer.
   2. Next, follow all the steps in section ***1. Changing the website's logo*** in the **Annex**.
   3. Once you have completed the steps, you will have successfully updated the logo of the website with your chosen image.

2. ***Changing the form in the 'Enter data' page***
   1. In the left menu in Webflow, click the **'Pages'** icon.
   2. Click the ***Patients – Enter data*** page.
   3. Let's adjust the Yes/No options fields:
      - Hover over the **yellow container** that contains the **'Cool down'** question until you see **'Container Yes_No'** (Step 1 – Figure 68), then **click** to select it.
      - **Right-click** the container and select ***Delete*** (Step 2 – Figure 68).

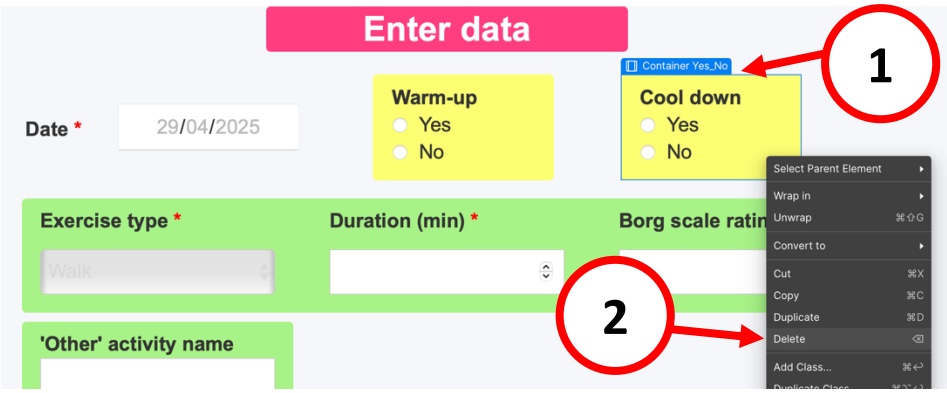

Figure 68. Deleting the 'Cool Down' question

- Now, **double-click** the **'Warm-up' label** (Figure 69).
    - Delete the existing text and replace it with **'Medication taken'** (Figure 70).

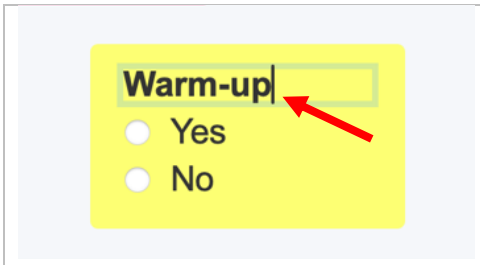

Figure 69. Modifying the 'Warm-Up' question

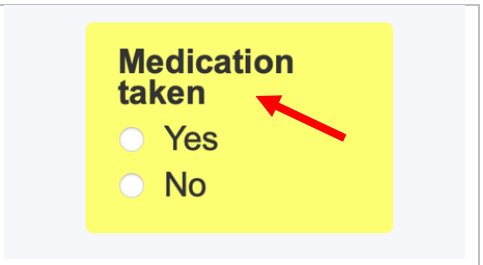

Figure 70. Replacing the label of the 'Warm-Up' question

4. Next, on the green container with three columns:
    - Click it to select it.
    - In the right panel, click ***Style*** (Figure 71).
    - Then, change the 'Layout' to ***Block*** (Figure 71). We are only changing this to make it easier to edit.

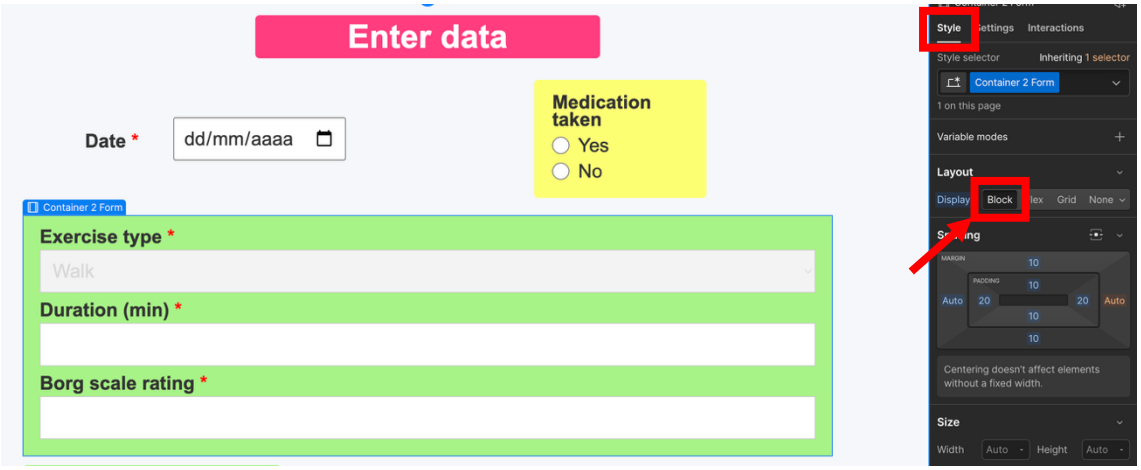

Figure 71. Changing the Layout of the green container

- Now, **double-click** the **'Exercise type' label**.
    - Delete the existing text (but **leave the red asterisk**) and replace it with: ***Question***

- **Double-click** the **'Duration (min)' label**.
    - Delete the existing text (but **leave the red asterisk**) and replace it with: ***Value***

- **Double-click** the **'Other activity name' label**.
    - Delete the existing text and replace it with: ***Additional comments***

The first part of the form should now look like Figure 72.

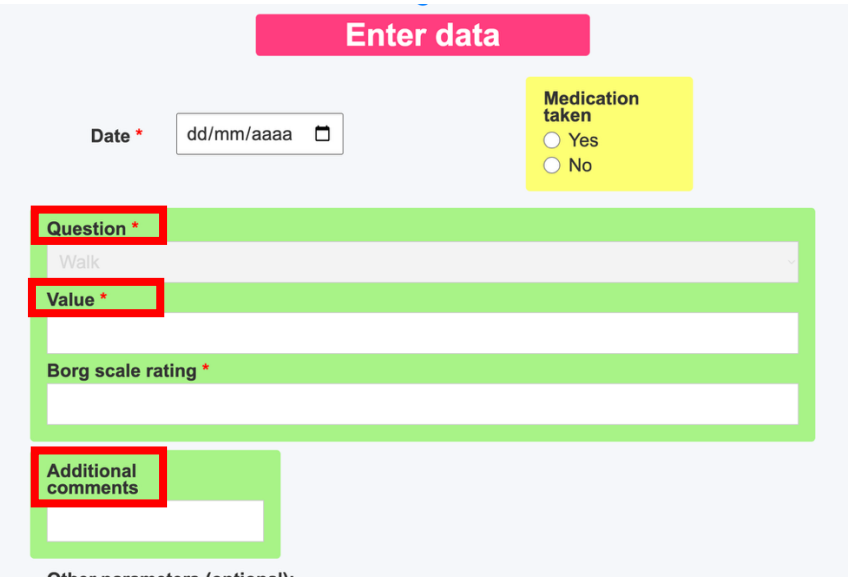

Figure 72. First part of the form with modifications

- Click the **field under 'Borg scale rating'** (Figure 73).
  - **Right-click** it and select ***Delete***.

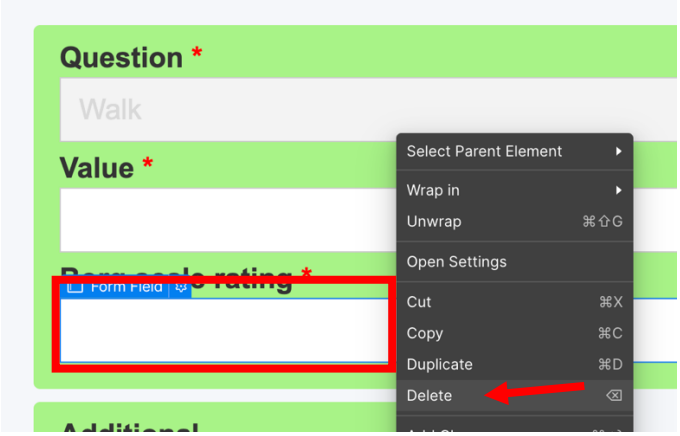

Figure 73. Deleting the 'Borg scale rating' label

- Click the **label 'Borg scale rating'**
  - **Right-click** it and select ***Delete*** (Figure 74).

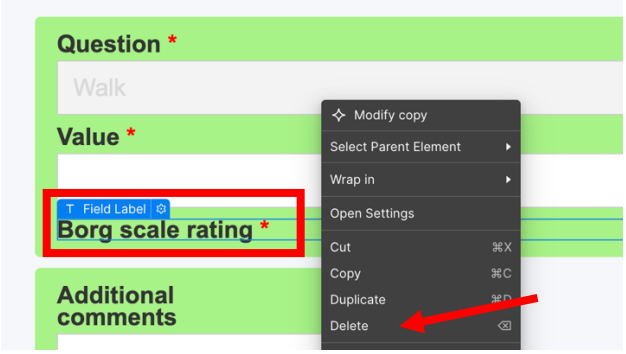

Figure 74. Deleting the 'Borg scale rating' label

5. Now, hover over the same **green container** until you see **'Container 2 Form'** (Step 1 – Figure 75), then **click** to select it.

   - In the right panel, click ***Style*** (Step 2 – Figure 75).

   - In 'Display', under *Layout*, click ***Grid*** (Step 3 – Figure 75).

   - Then, next to *Grid*: update the value for **'Columns'** to **2** (Step 4 – Figure 75), then press Enter to apply the change.

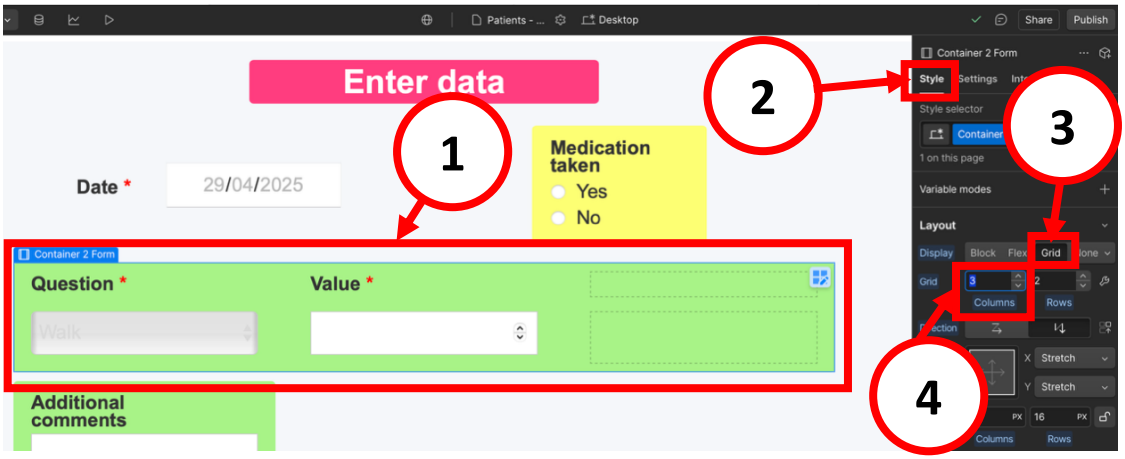

Figure 75. Changing the layout of 'Container 2 Form' to two columns

   - Now, the container form should look like Figure 76.

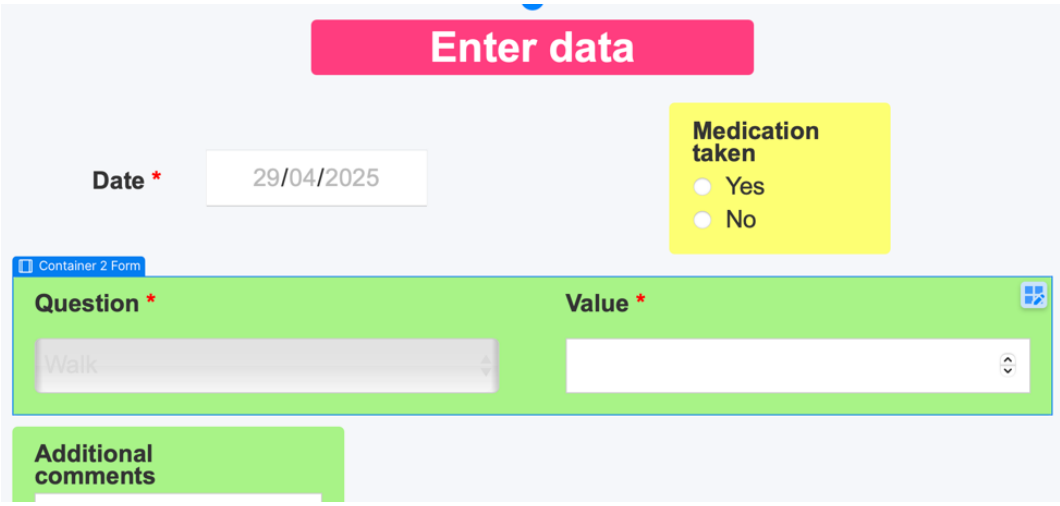

Figure 76. New layout of 'Container 2 Form'

6. Well done! Now, hover over the **green 'Additional comments' container** until you see **'Other_activity Container'** (Step 1 – Figure 77), then **click** to select it.

   - In the right panel, make sure you are on the ***Style*** tab (Step 2 – Figure 77).

   - Under *Size*, update the value next to *Width* to **320** (Step 3 – Figure 77), then press Enter to apply the change.

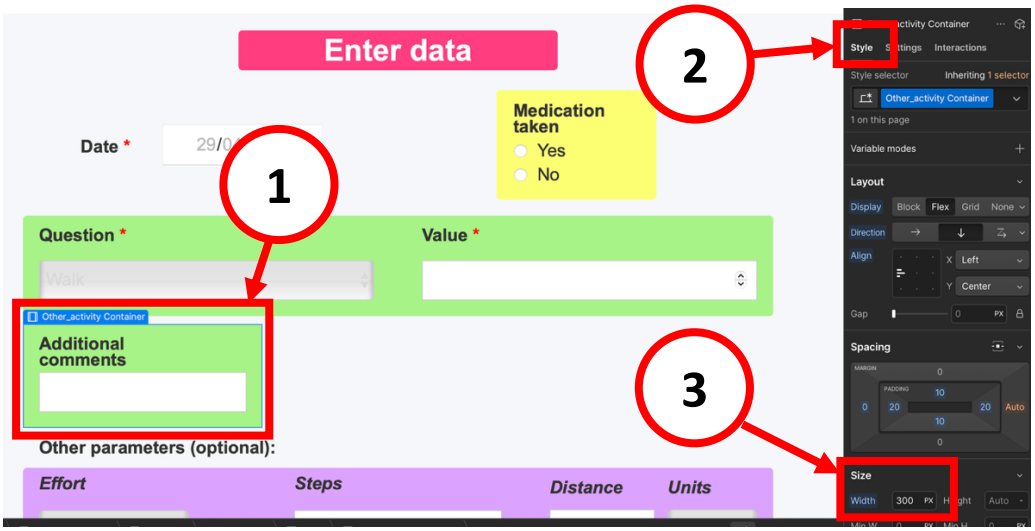

Figure 77. Updating the 'Width' value of the 'Additional comments' container

   - Perfect! We have just made the container bigger, so it fits the new label better.

7. Now**, double-click** the **field under 'Question'** (Step 1 – Figure 78).
   - The options of the dropdown will appear.

   - **Delete all the current options** by clicking the **trash icon** (Step 2 – Figure 78).

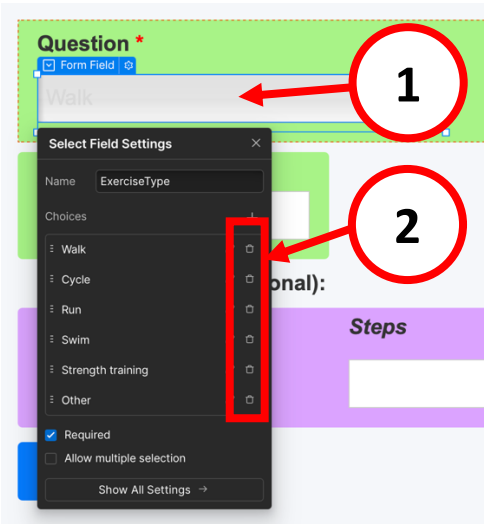

Figure 78. Deleting the dropdown options

- Now, click the **'+'** icon to add a new option (Figure 79):
    - Update the **'Text'** field with: ***Select one...***
    - Leave the **'Value'** field empty.

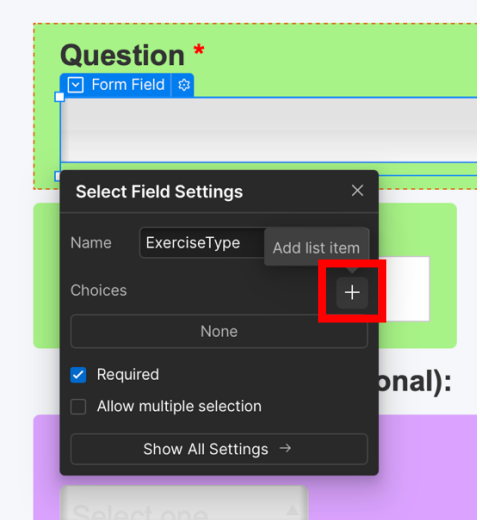

Figure 79. Adding a dropdown option

- Next, let's add the remaining options for the dropdown.
  Note: If you don't want to track some of the following options, you can skip them.

- Click the **'+'** icon again to add another option:
    - Update the **'Text'** field with: ***Sleep duration (hours)***
    - Update the **'Value'** field with: ***Sleep duration (hours)***

- Click the **'+'** icon to add another option:
    - Update the **'Text'** field with: ***Sleep Quality***
    - Update the **'Value'** field with: ***Sleep Quality***

- Click the **'+'** icon to add another option:
    - Update the **'Text'** field with: ***Exercise (in hours)***
    - Update the **'Value'** field with: ***Exercise (hours)***

- Click the **'+'** icon to add another option:
    - Update the **'Text'** field with: ***Exercise Effort***
    - Update the **'Value'** field with: ***Exercise Effort***

- Click the **'+'** icon to add another option:
    - Update the **'Text'** field with: ***Smoked units***
    - Update the **'Value'** field with: ***Smoked units***

- Click the **'+'** icon to add another option:
    - Update the **'Text'** field with: ***Alcohol units***
    - Update the **'Value'** field with: ***Alcohol units***

- Click the **'+'** icon to add another option:
  - Update the **'Text'** field with: ***Food Ingestion***
  - Update the **'Value'** field with: ***Food Ingestion***

The dropdown options should now look similar to those in Figure 80.

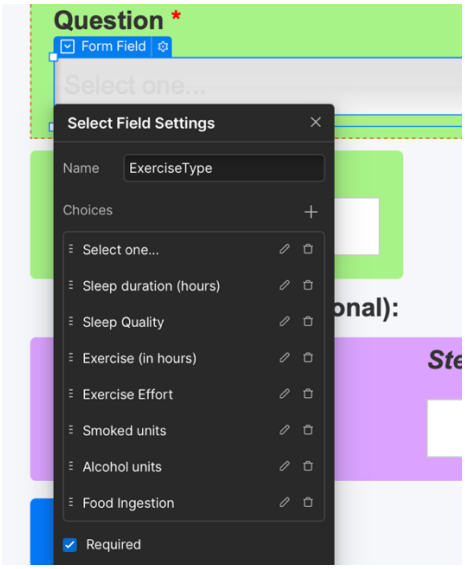

Figure 80. 'Question' dropdown with new options

8. Perfect! Now, let's delete some of the questions of the **purple container**:
   - Hover over the **'Steps' question** until you see **'Container Optional Field'** (Figure 81).
     - Then, **click** to select it.
     - **Right-click** it and select ***Delete***.

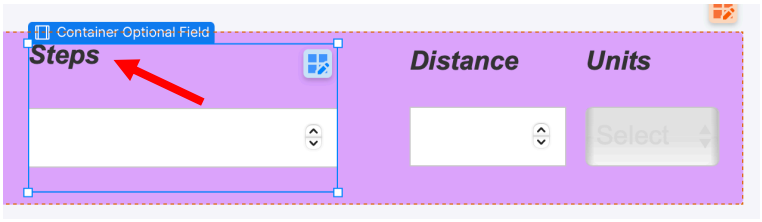

Figure 81. Selecting the 'Container Optional Field'

   - Then, hover over the **'Distance' and 'Units' questions** until you see **'Container Distance'** (Figure 82).
     - Then, **click** to select it.
     - **Right-click** it and select ***Delete***.

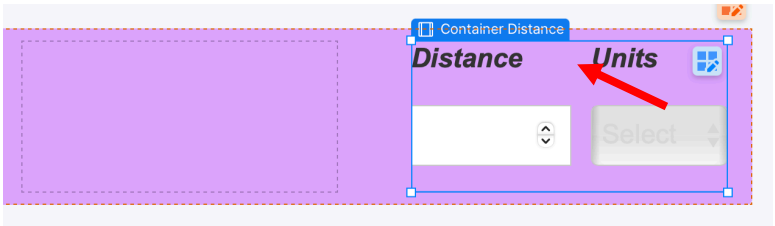

Figure 82. Selecting the 'Container Optional Field'

- Now, hover over the **purple container** until you see **'Container Other Parameters'** (Step 1 - Figure 83).
    - Click to select it.

    - In the right panel, make sure you are on the ***Style*** tab (Step 2 – Figure 83).

    - Under *Layout*, next to *Grid*: update the value for **'Columns'** to **1** (Step 3 – Figure 83), then press Enter to apply the change.

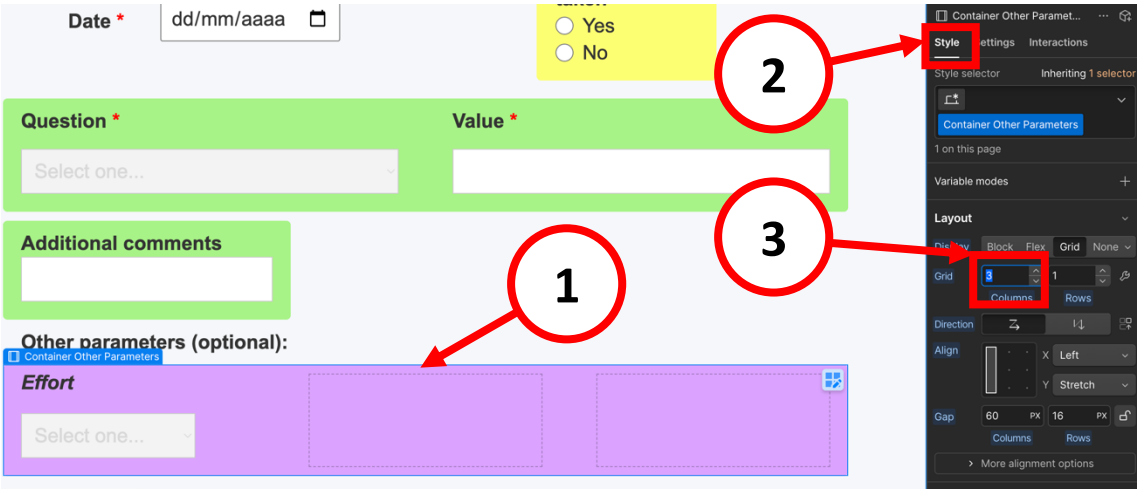

Figure 83. Modifying the 'Container Other Parameters'

- Now, scroll down in the right panel:
    - In *Spacing*, click on the 'Auto' under *Margin* and select **0** (Step 1 - Figure 84).

    - Under *Size*, update the value next to *Width* to **320** (Step 2 - Figure 84)

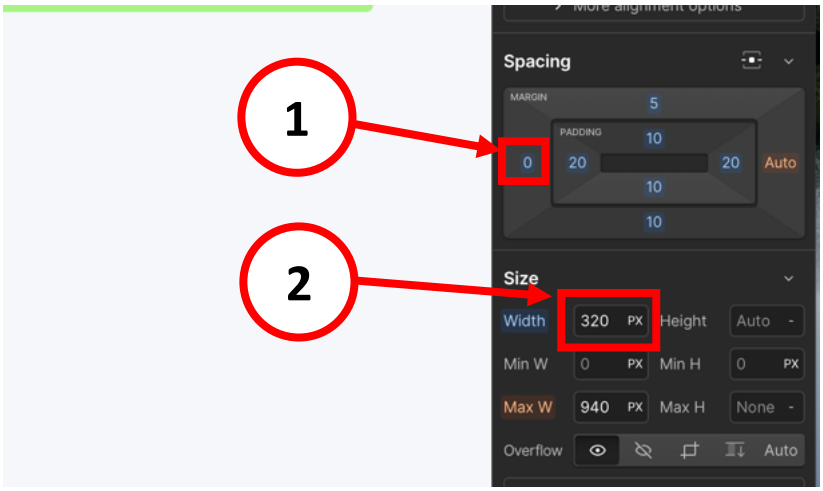

Figure 84. Modifying the 'Container Other Parameters'

9. We are almost done! Now, let's change the 'Effort' question to 'Wellbeing perception'. To do so, follow the next steps:
    - Hover over the **'Effort' question** until you see **'Container Optional Field'** (Figure 85).
        - **Click** to select it.
        - In the right panel, make sure you are on the ***Style*** tab.
        - Then, under *Layout*, change the *Display* to ***Block*** (Figure 86).

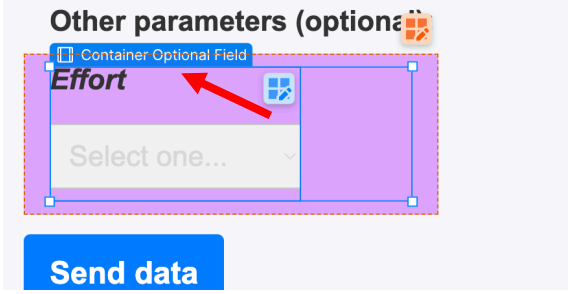

Figure 85. Selecting the 'Container Optional Field'

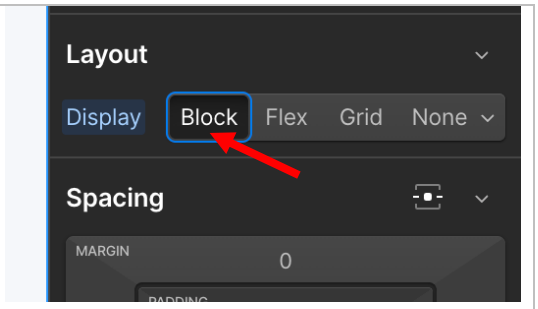

Figure 86. Changing the Display to 'Block'

- Now, **double-click** the **'Effort' label** (Figure 87).
    - Delete the existing text and replace it with **'Wellbeing perception'** (Figure 80).

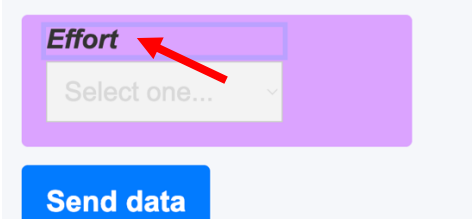

Figure 87. Modifying the 'Effort' label

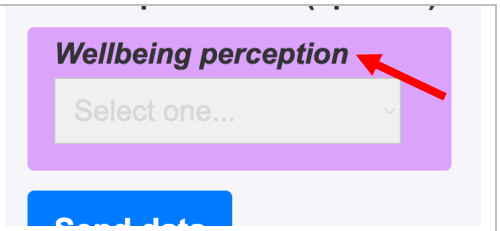

Figure 88. Replacing the label of the 'Effort' question

- **Double-click** the **field under 'Wellbeing perception'** to modify the dropdown options:
    - **Delete all the current dropdown options (except the 'Select one…' option)** by clicking the **trash icon**.

    - Click the **'+'** icon to add a new option:
        - Update the **'Text'** field with: **'Poor'**
        - Update the **'Value'** field with: **'Poor'**

    - Click the **'+'** icon to add another option:
        - Update the **'Text'** field with: **'Medium'**
        - Update the **'Value'** field with: **'Medium'**

    - Click the **'+'** icon to add another option:
        - Update the **'Text'** field with: **'Good'**
        - Update the **'Value'** field with: **'Good'**

The dropdown options **under 'Wellbeing perception'** should now look like in Figure 89.

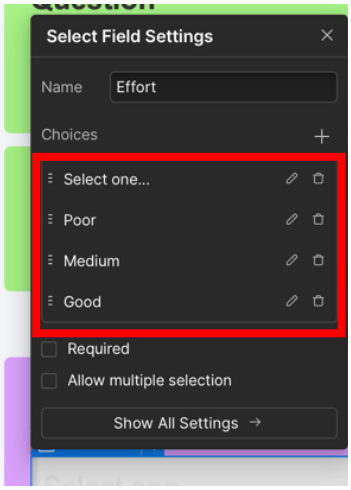

Figure 89. New 'Wellbeing perception' dropdown options

- Close the *Select Field Settings* panel by **clicking the 'X'**.

10. In the left menu, click the **'+' icon** (Step 1 – Figure 90).
- Search for the element ***Block Quote*** (Step 2 – Figure 90).
- Drag the element ***Block Quote*** into the form and place it between the two green containers (Figure 91).

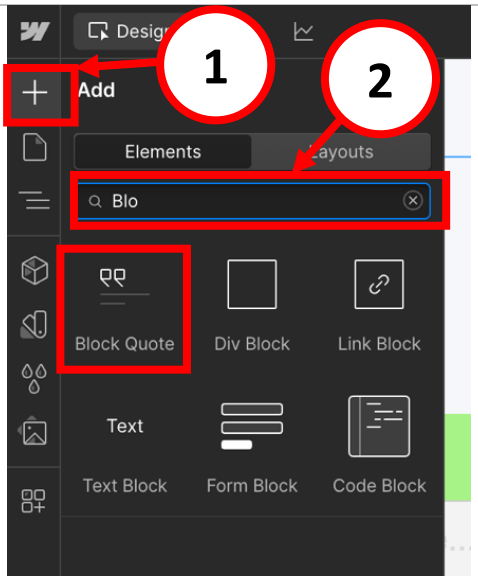

Figure 90. Adding the element 'Block Quote'

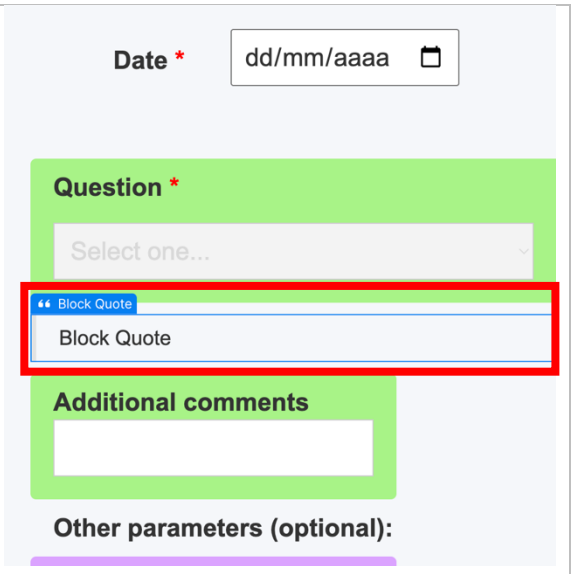

Figure 91. Placing the 'Block Quote' element

- **Double-click** the *Block Quote* in the form to edit it. Replace the text with the following (you can copy and paste it, and then adjust the spacing if needed):
  For **Sleep Quality** values: Bad = **1** / Medium = **2** / Good = **3**
  For **Effort** values: Low = **1** / Medium = **2** / High = **3**
  For **Food ingestion** values: Low = **1** / Medium = **2** / High = **3**

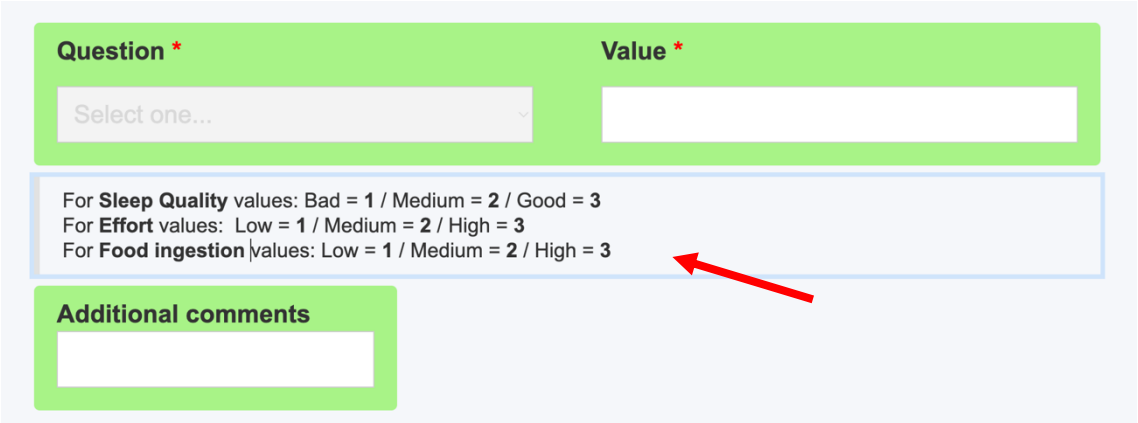

Figure 92. Form with the final 'Block Quote' element

11. **Congrats!** The form is now adapted.
    Next, follow the steps in *3. Adapting the graphs* section to update the corresponding graph views.

3. *Adapting the graphs*

1. In the left menu, click on the **'Pages'** icon.

2. Click the ***Patients – My track*** page.

3. Follow **Steps 3 to 5 from section *5.3. Deleting a filter*** **twice**:

   - First to **delete the *'Kilometers (Km)'* filter** (Figure 93).

   - And then to **delete the *'Select Borg Scale Range'* filter** (Figure 93).

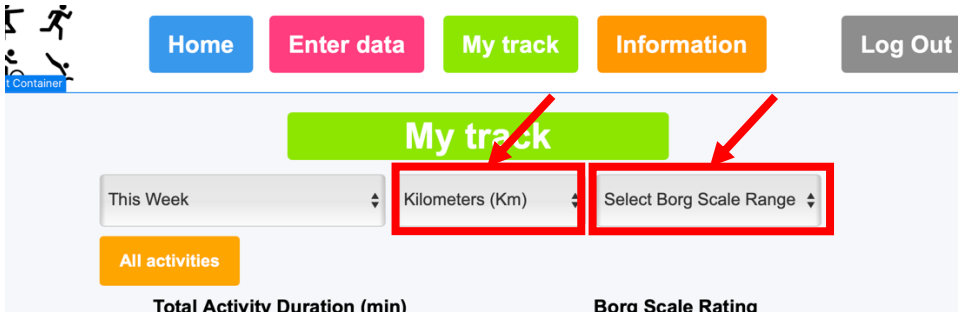

Figure 93. Filters to delete in the *Patients – My track* page.

4. Click the **'All activities'** button to select it (Figure 94).

   - **Right-click** it and select ***Delete***.

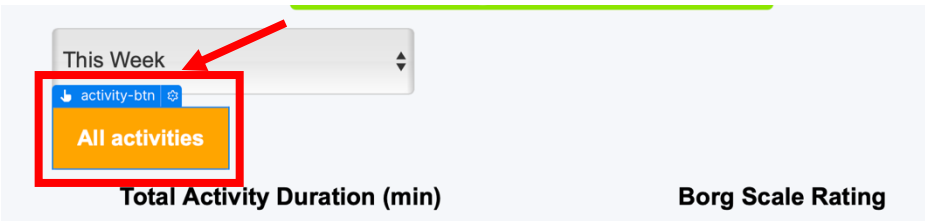

Figure 94. Deleting the 'All activities' button

5. Now, hover over the **'Borg Scale Rating'** graph area until you see **'Container Graphs Grid'** (Figure 95).

   - **Click** to select it.

   - **Right-click** it and select ***Delete***.

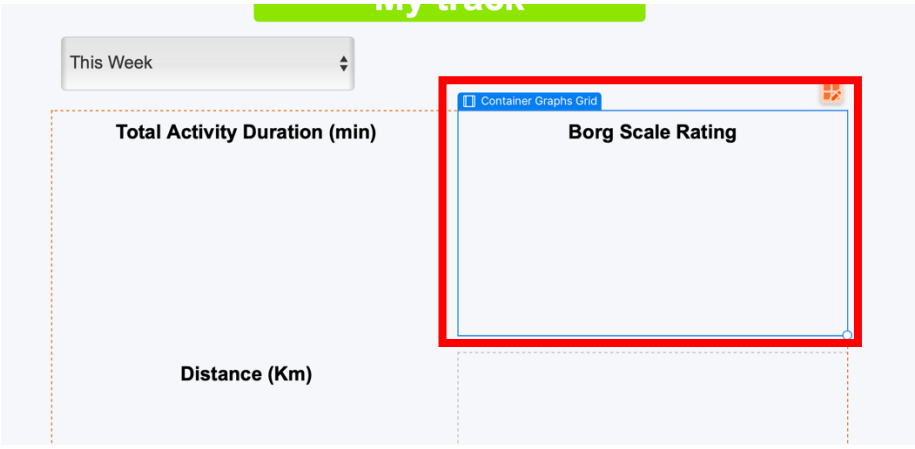

Figure 95. Deleting the 'Container Graphs Grid' of 'Borg Scale Rating'

6. Repeat the previous step (Step 5) for the **'Distance (Km)'** graph area (Figure 96).

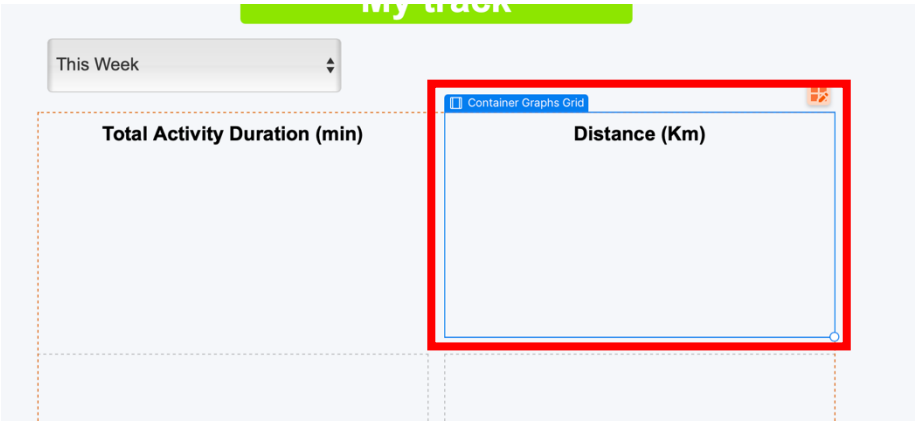

Figure 96. Deleting the 'Container Graphs Grid' of 'Distance (Km)'

7. Perfect! Now we have the graph we want on the screen, but we need to adjust its position to center it.
   - To do this, hover over the area until you see **'Container Grid'** (see Step 1 - Figure 97) and **click** to select it.

   - In the right panel, click ***Style*** (Step 2 - Figure 97).

   - Under *Layout*, next to *Grid*: set **'Columns'** to **1** and **'Rows'** to **1** (Step 3 – Figure 97). In Figure 97, both values are currently 2 – these are the values you need to change to 1.

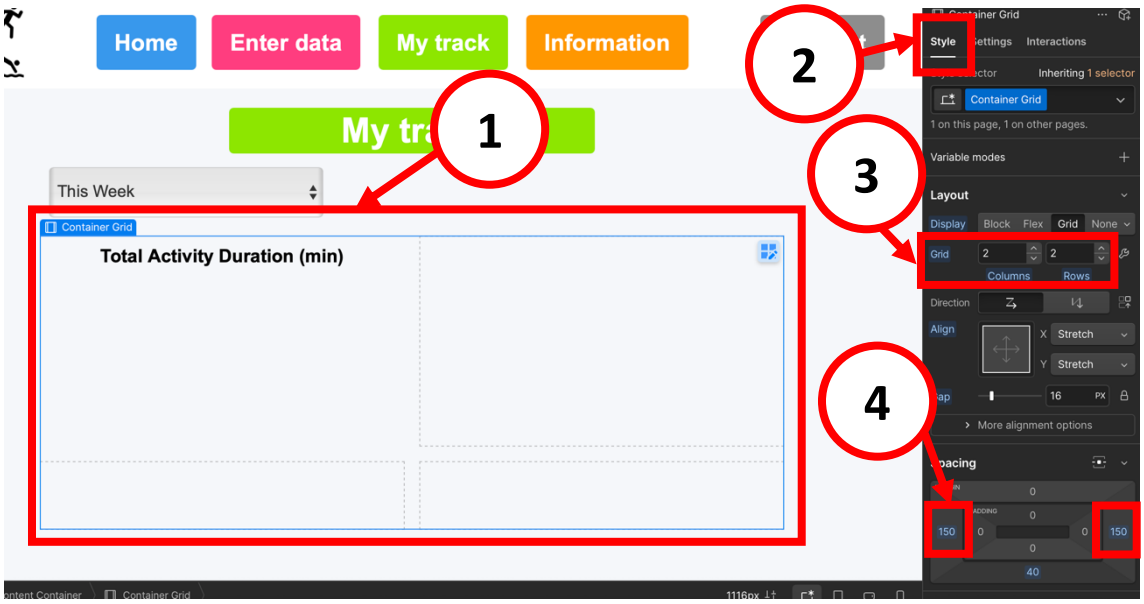

Figure 97. Modifying 'Container Grid'

   - Then, under *Spacing*, click the **left margin field** (Step 4 – Figure 97), set it to **240** (Figure 98) and press Enter to apply the change.
   Do the same for the **right margin field**.

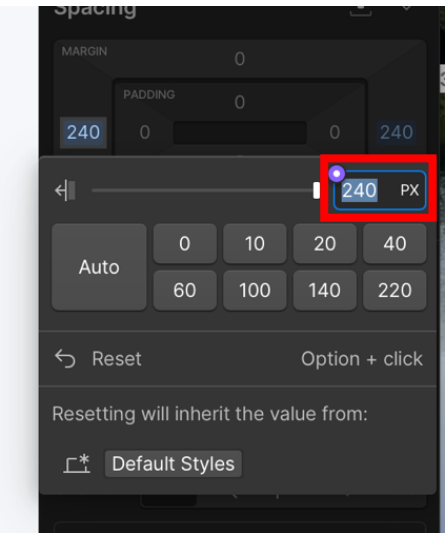

Figure 98. Setting the left and right margins to 240 px

8. Next, click on the **'Total Activity Duration (min)' title**.
   - **Right-click** it and select ***Delete*** (Figure 99).

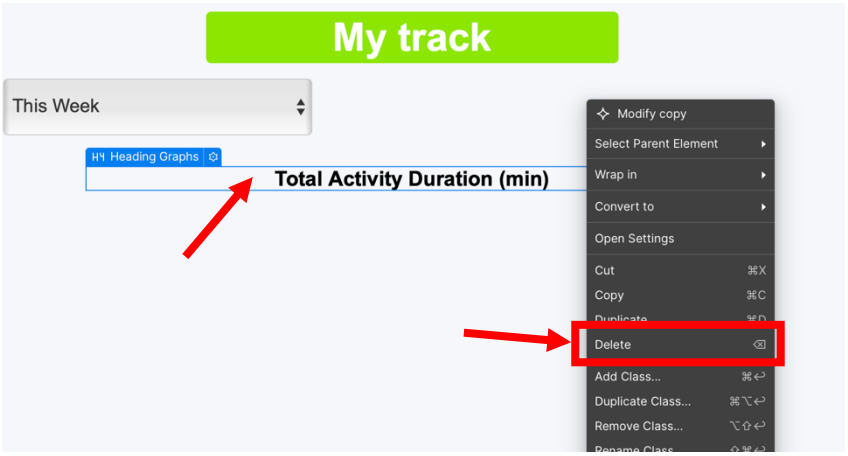

Figure 99. Deleting the 'Total Activity Duration (min)' title

9. Perfect. Now that we have modified the graphs for the desktop view of the website, let's move on to adjusting the graphics for the phone version.

- On the **top menu**, click **'Desktop'**. Then, click **'Mobile (L)'** to switch the display view (Figure 100).

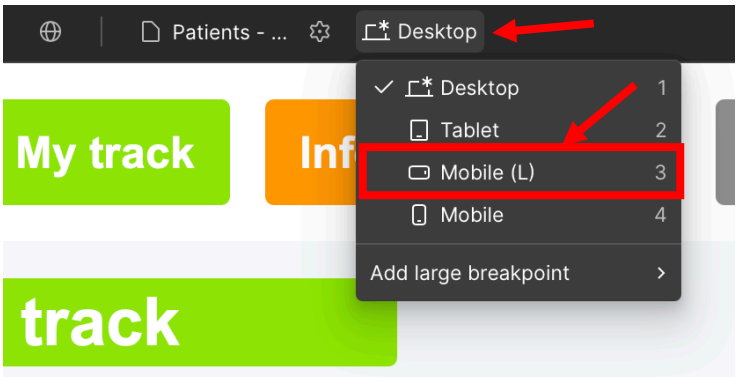

Figure 100. Switching the display view to 'Mobile (L)'

10. Next, click on the **Navigator icon** in the left-menu **(Step 1 – Figure 101)**.

    *Note: The Navigator contains the structure of the different elements that appear on the page. The **arrow icons (>)** are used to view the different components inside each element.*

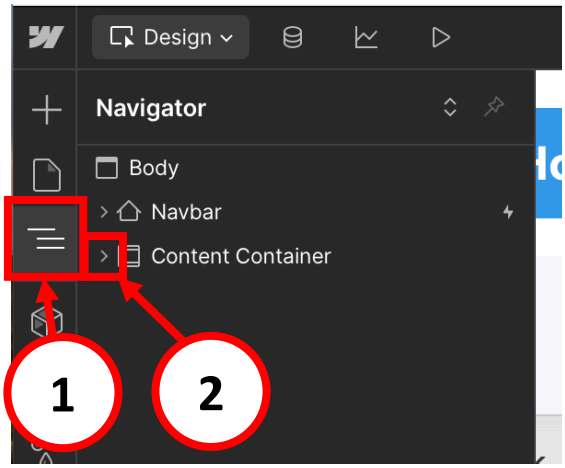

Figure 101. Opening the Navigator menu

11. Click the **arrow icon (>)** next to **'Content Container'** (Step 2 - Figure 101), if it is not already open.

12. Click the **arrow icon (>)** next to **'Slider'** in the Navigator (Step 1 – Figure 102), if it is not already open.

- Then, click the **arrow icon (>)** next to **'Mask'** (Step 2 – Figure 102).

- Right-click ***Slide 3*** and select ***Delete*** (Step 3 – Figure 102).

- Right-click ***Slide 2*** and select ***Delete***.

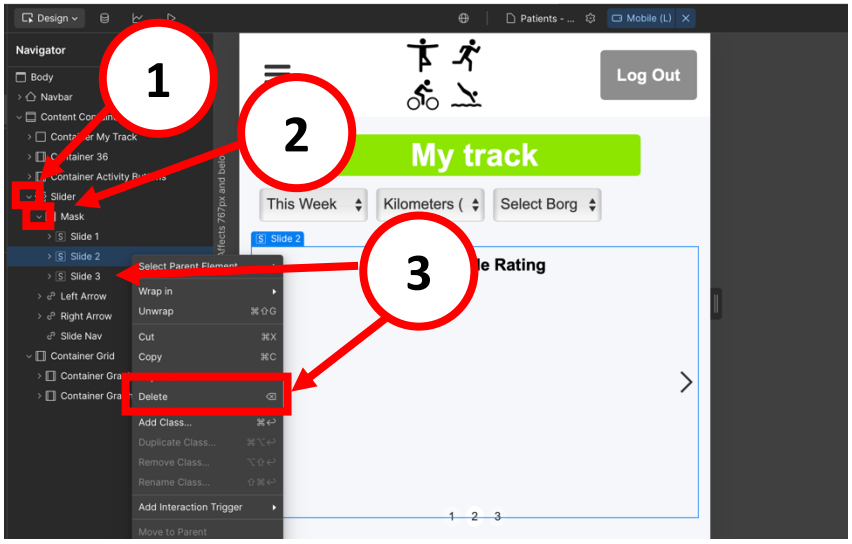

Figure 102. Deleting graphs in mobile display view

- Click the **arrow icon (>)** next to **'Slide 1'** (Step 1 – Figure 103).

- Right-click on **'Heading Graphs'** and select ***Delete*** (Step 2 – Figure 103).

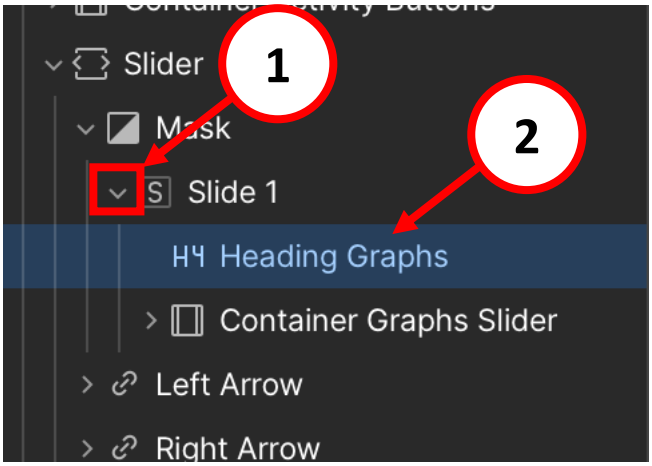

Figure 103. Deleting 'Heading Graphs' in 'Slide 1'

- Perfect! You have successfully adapted the graphs for both the desktop and mobile views. **Click the 'X' next to 'Mobile (L)'** at the top of the screen to exit the mobile view.

13. Great! Now, in the left menu, click on the **'Pages'** icon.

14. Click the ***Staff – My patients*** page.

15. **Repeat Steps 3 to 6 and 8 to 12 for this page (Skip Step 7).**

16. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

17. Great. Now, just a few more steps to complete! Go to **Xano**.
Let's update the database to align with the form.

18. Click on ***Database*** in the left menu.
Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

19. Then, click on the **'data_entries'** table.

20. **Right-click** the column name **'WarmUp'**.
- Then, select ***Rename*** (Figure 104).
- Rename it to **'MedicationTaken'** (Figure 105).
- Click ***Save***.
- A confirmation banner will appear, click ***Confirm***.
- A panel in the right side of the screen will appear, click ***Update references*** (Figure 106).

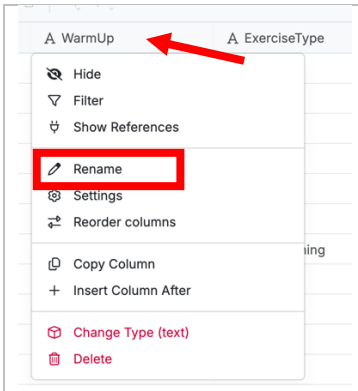

Figure 104. Renaming a column in Xano

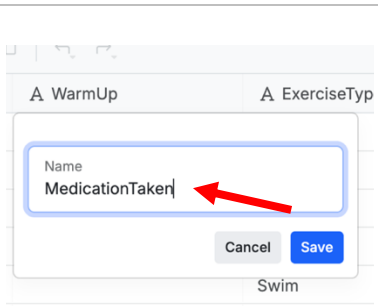

Figure 105. Renaming 'WarmUp' column to 'MedicationTaken'

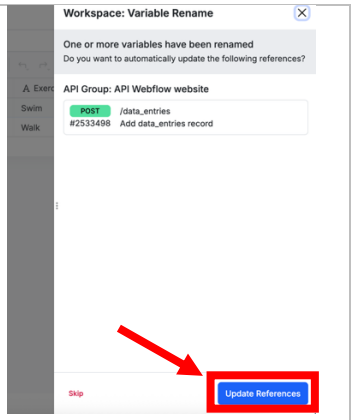

Figure 106. Clicking 'Update References'

21. Scroll to the right and **right-click** the column name **'Other_activity'**.
- Then, select ***Rename*** and rename it to **'Comments'**.
- Click ***Save***.
- A confirmation banner will appear, click ***Confirm***.
- A panel in the right side of the screen will appear, click ***Update references***.
- Click at the **'⇌' next to the name of the column 'Comments'**.
- Reorder the column 'Comments' by dragging it under 'Duration'.
- Click ***Save***.

22. **Right-click** the column name **'BorgScale'**.
- Then, select ***Delete.***
- A confirmation banner will appear, click ***Delete*** again.

23. **Right-click** the column name **'Steps'**.
- Then, select ***Delete.***
- A confirmation banner will appear, click ***Delete*** again.

24. **Right-click** the column name **'Effort'**.
- Then, select ***Rename***.
- Rename it to **'Wellbeing'**.
- Click ***Save***.
- A confirmation banner will appear, click ***Confirm***.
- A panel in the right side of the screen will appear, click ***Update references***.

- **Right-click** the new column name **'Wellbeing'**.
- Then, select ***Change Type (integer)*** (Figure 107).
- Under *Type* select **'text'** (Figure 108).
- Click ***Save.***

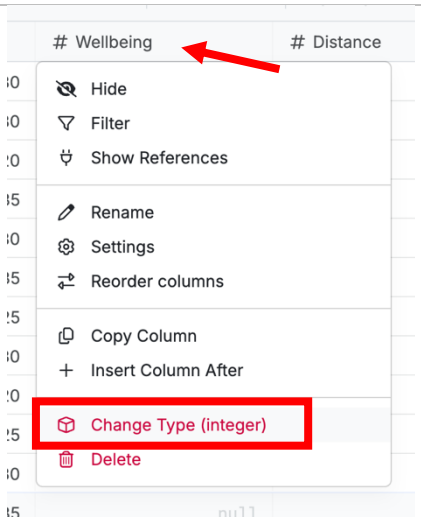

Figure 107. Clicking 'Change Type (integer)' in 'Wellbeing' column

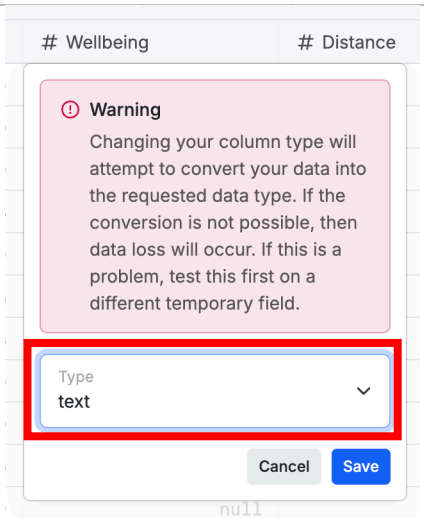

Figure 108. Changing Type to 'text' in 'Wellbeing' column

25. **Right-click** the column name **'Distance'**.
- Then, select ***Delete.***
- A confirmation banner will appear, click ***Delete*** again.

26. **Right-click** the column name **'Units'**.
- Then, select ***Delete.***
- A confirmation banner will appear, click ***Delete*** again.

27. **Right-click** the column name **'CoolDown'**.
- Then, select ***Delete.***
- A confirmation banner will appear, click ***Delete*** again.

28. Now, **check the box next to '# id'** (Step 1 – Figure 109) to select all the entries.
- Then, click ***Delete*** (Step 2 – Figure 109)
- A confirmation banner will appear, click ***Confirm***.

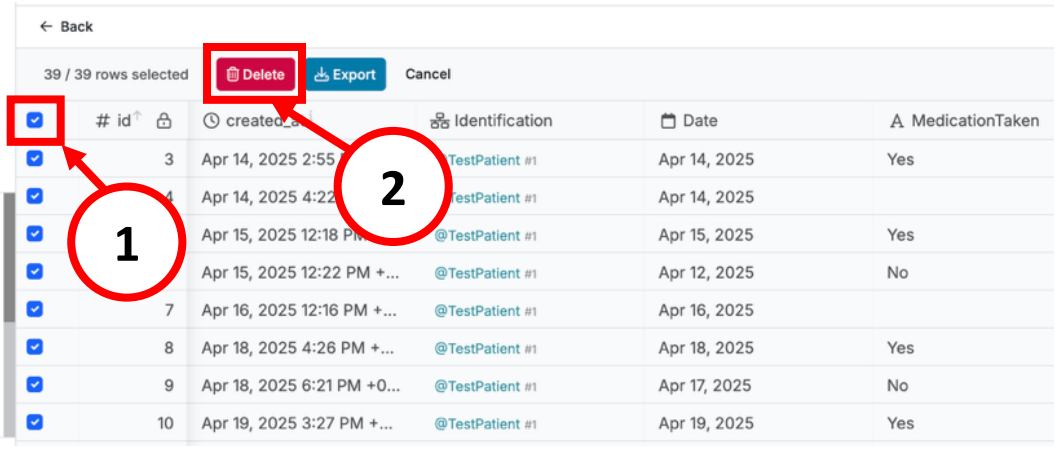

Figure 109. Deleting all existing entries

29. Great! Now, while still in Xano:
- Click on **API** in the left menu (Step 1 – Figure 110).

- Then, click on the folder named **'API Webflow website'** (Step 2 - Figure 110).

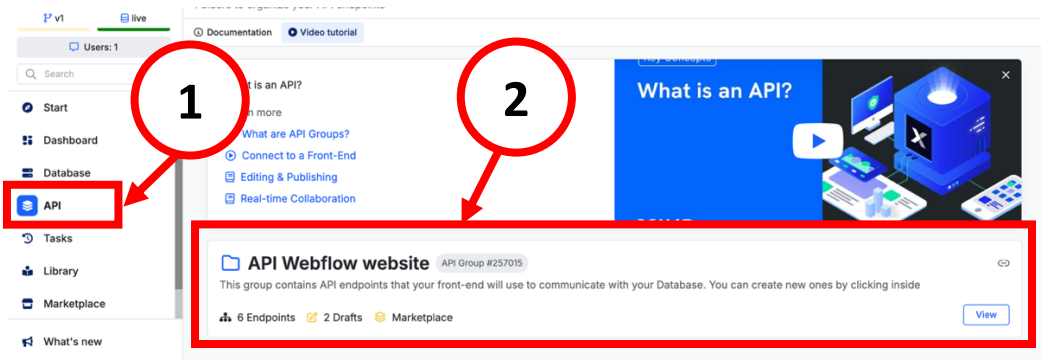

Figure 110. Accessing the 'API Webflow website' folder in Xano

- Inside the folder, there is a section named **'data_entries'**. In that section, you will see **POST data_entries** marked as ***'Draft'*** (Figure 111).

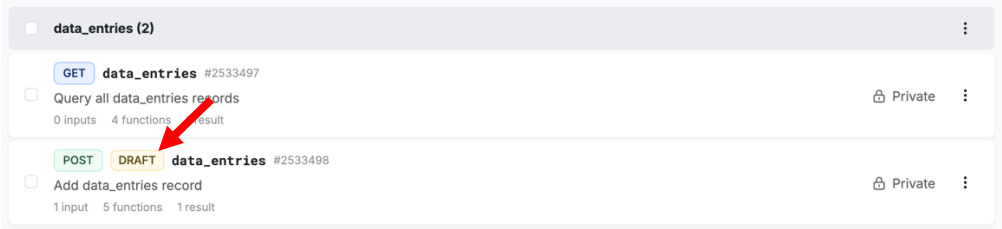

Figure 111. Section 'data_entries' inside the 'API Webflow website' folder in Xano

30. Click on **POST data_entries**

31. Then, click the **'Publish'** button **(Figure 112).**

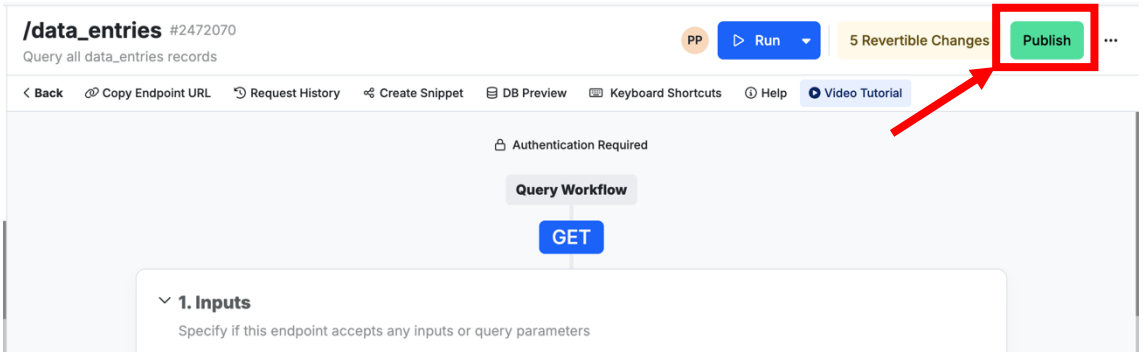

Figure 112. 'Publish' button inside a subsection

32. A tab will appear in the right side of the screen.
- Click the ***Publish*** button again (See Figure 113).

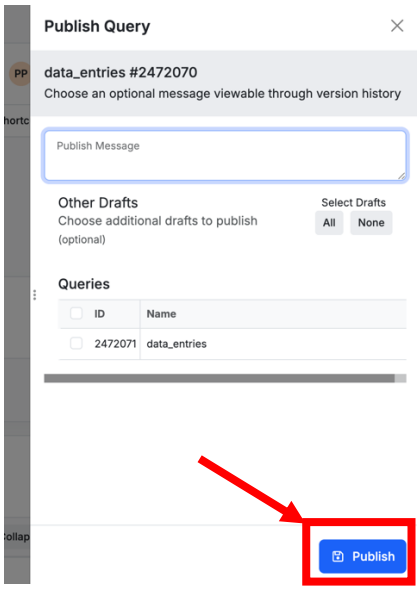

Figure 113. 'Publish' button in the new tab

33. Return to the previous screen.

34. **Congratulations!** You have successfully adapted the graphs and the corresponding database structure.
Now you can go to the published website and try sending information as a patient, and viewing it as a patient and as a staff user, to make sure everything is working as expected.

4. *Managing information documents*

1. The website has two 'Information' pages:
   - One that only patients can see: ***Patients – Information*** page
   - And one that only staff members can see: ***Staff – Information*** page

2. To view the information documents available for patients, log into the published website as a patient and click on the documents on the *Information* page.
   You can do the same with a test staff user to view their documents.

3. Now, follow the steps in steps in section ***How to delete a document, image, link or video*** to delete an information document.

4. Perfect! Now, let's add a new one. **Choose an information document, image, link or video** you would like to add to the website.

5. **Decide** whether you want to add the document to the patient information page, the staff information page, or both.

6. If you want to add it to:

   - The patient information page:
     - Follow the steps in section ***How to add a document, image, link or video*** and, in Step 2, click ***Patients – Information*** page.

   - The staff information page:
     - Follow the steps in section ***How to add a document, image, link or video*** and, in Step 2, click ***Staff – Information*** page.

   - Both pages:
     - Follow the steps in section ***How to add a document, image, link or video*** **twice**:
       - First time: In Step 2, click ***Patients – Information*** page.
       - Second time: In Step 2, click ***Staff – Information*** page.

Once you have followed these sections, you will have successfully converted the website into a patient behaviour and wellbeing monitoring website.

Additionally, if you would like to change the title of the website in the Log In page, you can:

- In Webflow, click the **'Pages' icon**.
- Click ***Log In Page***
- **Double-click** the title 'Home-based exercise monitoring' and edit it to the title you prefer.

Annex A: How to Modify the Website

*Note: To make the modifications in the website (in Webflow) that are explained in this Annex, it is important to make sure you are in **'Design' mode** (Figure A.1).*

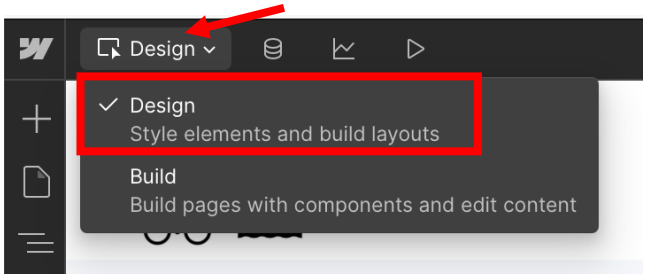

Figure A.1. Verifying that 'Design' mode is enabled in Webflow

1. Changing the website's logo (level of difficulty: **1**/5)

1. In Webflow, click ***Open site*** to start editing your website (if you are not already doing so).

2. Access ***Assets*** from the left-menu (Step 1 – Figure A.2)

3. Click the **'Upload' icon** (Step 2 – Figure A.2)

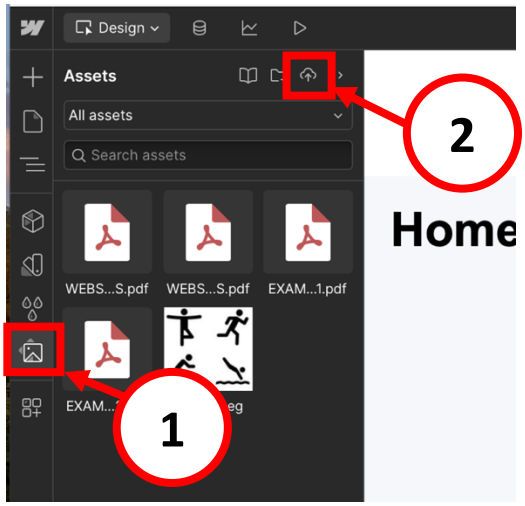

Figure A.2. Uploading 'Assets' in Webflow

4. **Select the image** from your computer that you would like to use as logo **and upload it**.

5. Click the ***Assets*** icon again to close the panel.

6. Now, we will replace the existing logo on the page with the new image. This change will automatically be applied across all the pages of the website.

6.1. **Double-click** the **current logo image** until it is outlined in blue (Step 1 – Figure A.3).

6.2. Click the **‘ ⚙ ’ icon** next to *Image* (Step 2 – Figure A.3).

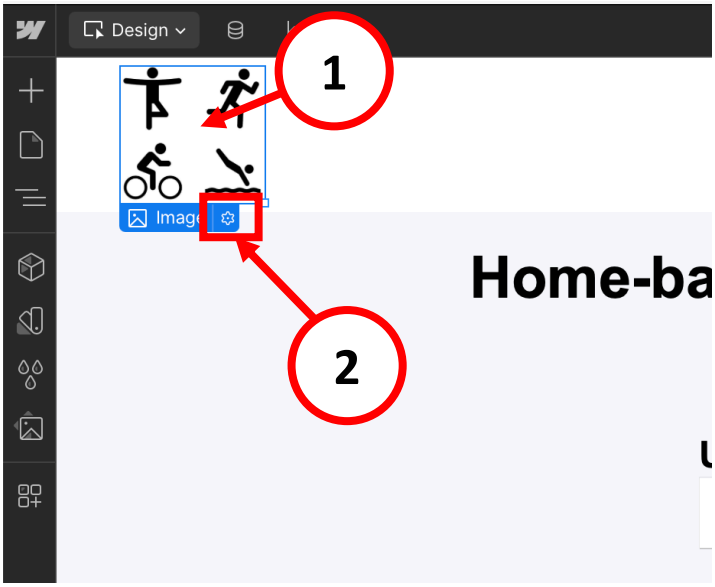

Figure A.3. Opening the logo’s image settings

6.3. Click on ***Replace Image*** (Figure A.4).

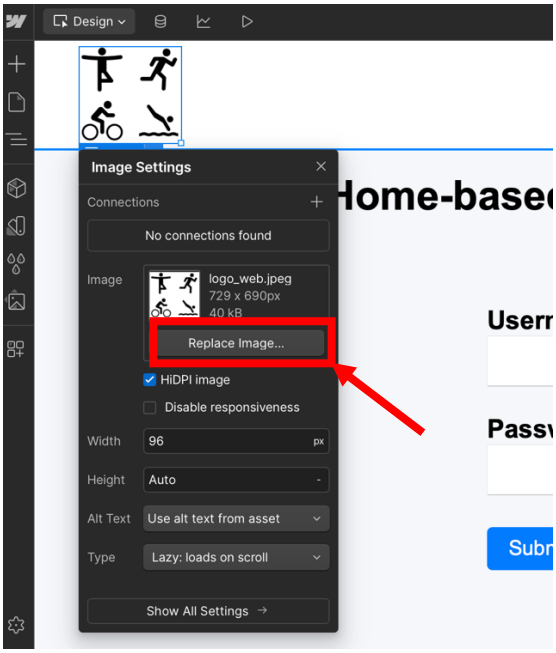

Figure A.4. *Replace Image* location in Image Settings

6.4. **Select the image** you uploaded earlier from the asset library.

6.5. Close the Image Settings panel by clicking the ‘X’.

6.6. **Adjust the image size** by dragging the bottom-right corner until it reaches the desired dimensions (Figure A.5).

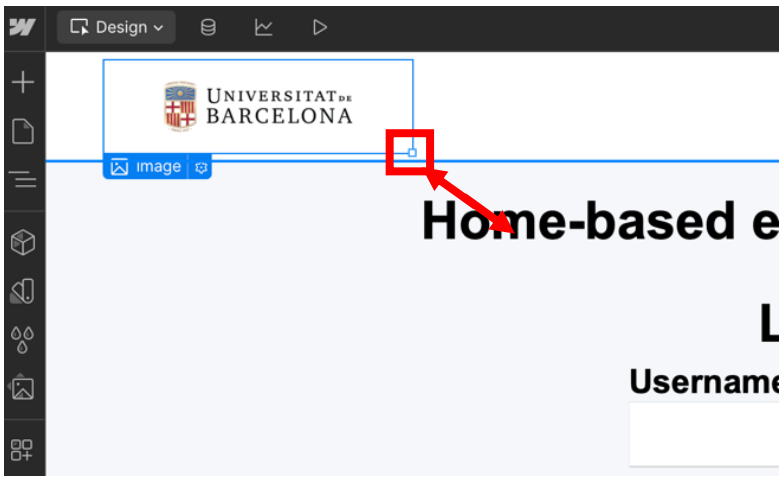

Figure A.5. Adjusting the logo image size using the bottom-right corner.

7. Double-click anywhere on the page to stop selecting the image.

8. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

9. Congrats! You have successfully changed the website's logo.

Note:

- *If you arrived here while following Example 1, click here to return to Example 1.*
- *If you arrived here while following Example 2, click here to return to Example 2.*

2. Modifying the 'Information' pages (level of difficulty: **1**/5)

The website has two 'Information' pages:

- One that only patients can see: ***Patients – Information*** page
- And one that only staff members can see: ***Staff – Information*** page

Thus, each Information page can contain different documents.

This section shows *How to add a document, image, link or video* and *How to delete a document, image, link or video*.

2.1. How to add a document, image, link or video

1. Open your site in Webflow. Click on **'Pages'** in the left menu (Step 1 – Figure A.6)**.**

2. If you: (Step 2 – Figure A.6)

- Want to **update the patients' information documents**:
  → click on ***Patients – Information*** page

- Want to **update the staff's information documents**:
  → click on ***Staff – Information*** page

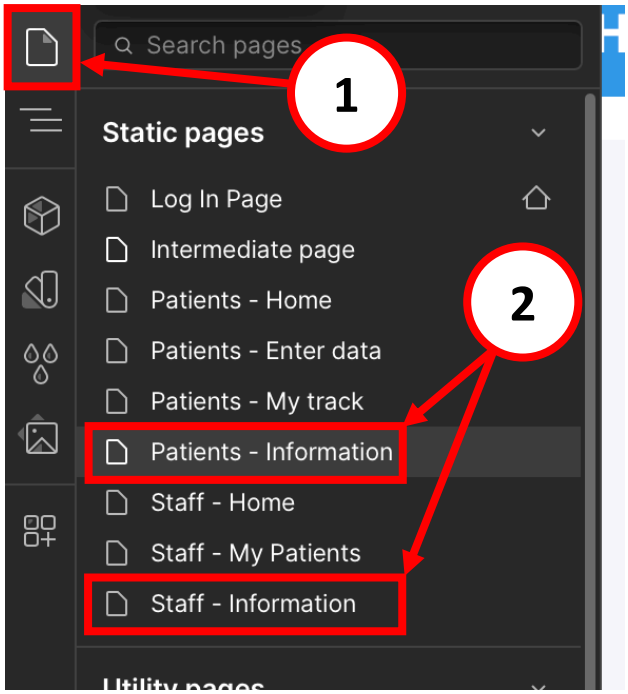

Figure A.6. Locating the Patients' and Staff's Information pages in the 'Pages' menu

3. Hover your mouse over the screen until you see **'Container Info' (Step 1 – Figure A.7)**, then **click to select it**.

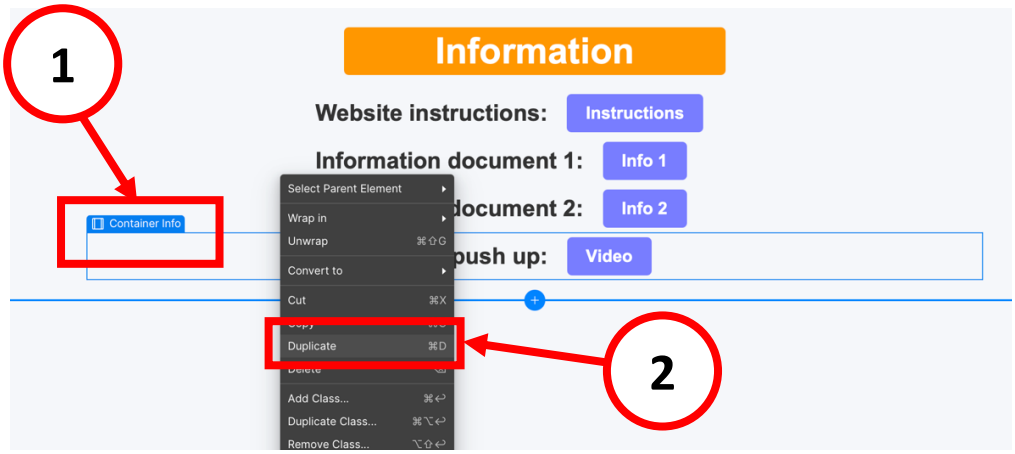

Figure A.7. Duplicating the 'Container Info'

4. **Right-click** on the selected container.

5. **Select 'Duplicate' (Step 2 – Figure A.7)**.
This will create a copy of the container, which includes a title and a button (linked to the document or link). We are going to edit this duplicate to add our new document, link or video.

6. In the duplicate container:
- Double-click the **title** to edit it (Figure A.8)
- Double-click the **button** to change its name (Figure A.9).

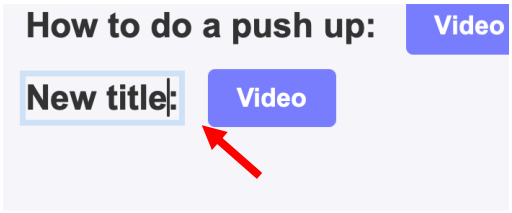

Figure A.8. Editing the title of the information document

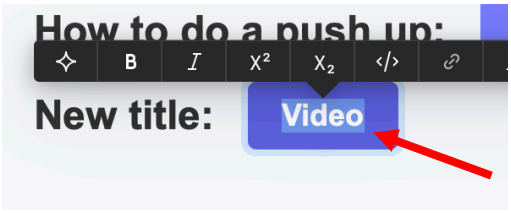

Figure A.9. Editing the name of the information document button

7. Now, let's change where the button links to.
- **Click the button**.
- Then, click the **' ⚙ ' icon** next to *Info button* (Figure A.10).

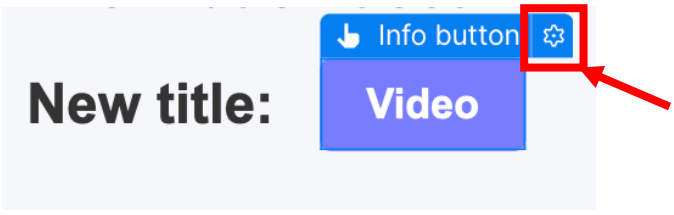

Figure A.10. Accessing the settings of a button

- Follow the steps within:
  - Step 7.1. – If you want to add a **document or image**
  - Step 7.2. – If you want to add a **link**
  - Step 7.3. – If you want to add a **video**

7.1. **Adding a Document or Image**

- Click on the **'File' icon** (Step 1 – Figure A.11)

- Click on **'Choose Attachment'** (Step 2 – Figure A.11)**, or 'Replace Attachment'** (Figure A.12) if a document is already linked, and the 'Assets' panel will open.

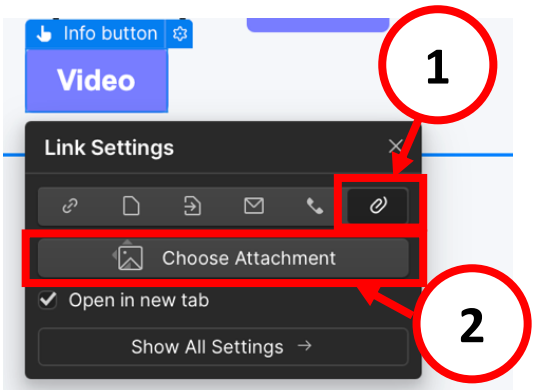

Figure A.11. Adding a file attachment to a button

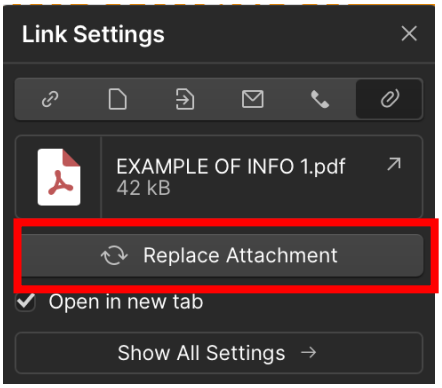

Figure A.12. Replacing attachment in a button

- Click the **'Upload' icon** (Figure A.13) and **upload the document or image** that you want to attach.
  - If you already have the file in the 'Assets' panel, just select it.

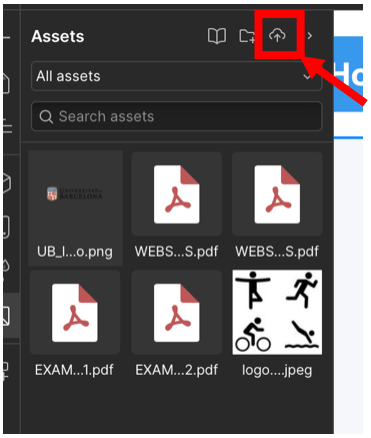

Figure A.13. Uploading a file in the assets panel

- **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

- Done! The document or image is now linked.

Note:

- *If you arrived here while following Example 1, click here to return to Example 1.*
- *If you arrived here while following Example 2, click here to return to Example 2.*

7.2. **Adding a Link**

- Click on the 'Link' icon (Step 1 – Figure A.14)

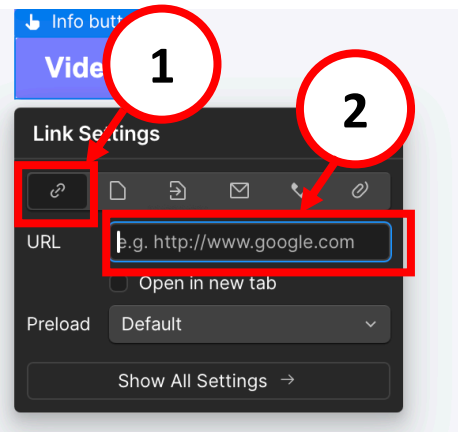

Figure A.14. Adding a link to a button

- Enter the desired link in the URL field (Step 2 - Figure A.14).
  - If you want the link to open in a new tab, check the option ***Open in a new tab***.

- **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

- Done! The link has been successfully added.

Note:

- *If you arrived here while following Example 1, click here to return to Example 1.*
- *If you arrived here while following Example 2, click here to return to Example 2.*

7.3. **Adding a Video**

There are two ways to add a video:

- **YouTube**
  - Upload the video on YouTube.
  - Set its visibility to **'Unlisted'**. This means only people with the link can view it.
  - Add video link as shown in **Step 7.2**.

- **Google Drive**
  - Upload you video to Google Drive.
  - Click **Share**.
  - Under "General access", click the down arrow.
  - Select 'Anyone with the link'.
  - Choose the role **'Viewer'**.
  - Click **Copy link**.
  - Click **Done**.
  - Add the link as shown in **Step 7.2**.

Publish the website to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

Note:

- *If you arrived here while following Example 1, click here to return to Example 1.*
- *If you arrived here while following Example 2, click here to return to Example 2.*

2.2. How to delete a document, image, link or video

1. Open your site in Webflow. Click on **'Pages'** in the left menu (Step 1 – Figure A.15)

2. If you: (Step 2 – Figure A.15)

- Want to **delete an information document from the patients' page**:
  → Click ***Patients – Information***

- Want to **delete an information document from the staff's page**:
  → Click ***Staff – Information***

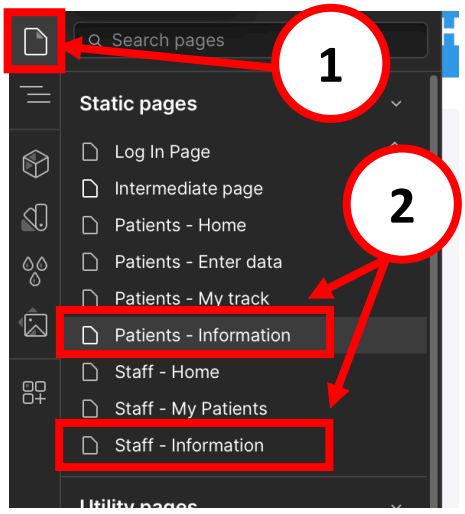

Figure A.15. Locating the Patients' and Staff's Information pages in the 'Pages' menu

3. Hover your mouse over the screen until you see **'Container Info' for the container you want to delete** (Step 1 – Figure A.16).

- **Click to select it.**

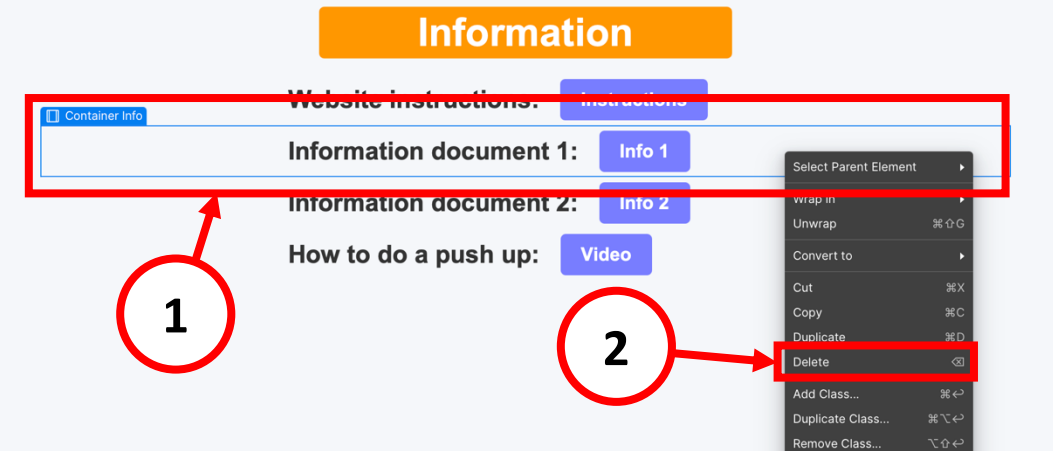

Figure A.16. Deleting a container containing a document, image, link or video

4. **Right-click** on the selected container.

5. Click ***Delete*** (Step 2 – Figure A.16).

6. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

7. Done! The item has been removed.

Note:

- *If you arrived here while following Example 1, click here to return to Example 1.*
- *If you arrived here while following Example 2, click here to return to Example 2.*

3. Modifying the message system (level of difficulty: **2**/5)

Currently, the website allows:

- Patients to send messages to staff.
- Staff to read all messages sent by patients.
- Staff to send messages to individual patients.

In this section, we will go over how to:

- Restrict patients from sending messages (if you only want staff to communicate or send feedback to the patient)
- Remove the messaging system entirely (if you no longer need this feature)

3.1. Restrict patients from sending messages

1. In Webflow, click ***Open site*** to start editing your website. In the left menu, click on the **'Pages'** icon.

2. Click on ***Patients – Home*** page.

3. Click the **'Navigator' icon** (Step 1 – Figure A.17) in the left-menu.
   This contains the structure of the different elements that appear on the page.

4. Click on the **'Send a message Heading'** (Step 2 – Figure A.17)

- Press the **Delete** key on your keyboard
- Or, right-click and select the option *Delete*.

Note: If you cannot find the 'Send a message Heading' in your screen's navigator, ***click on the arrow icons (>) to view the different elements inside each element****.*

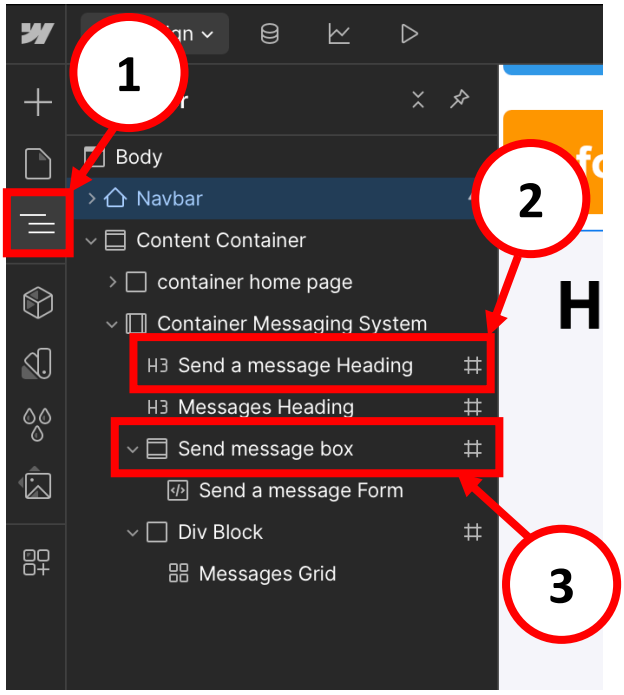

Figure A.17. Navigator menu on Webflow

5. **Repeat Step 4** for the **'Send message box'** (Step 3 – Figure A.17). Figure A.18 shows how the page should look like now.

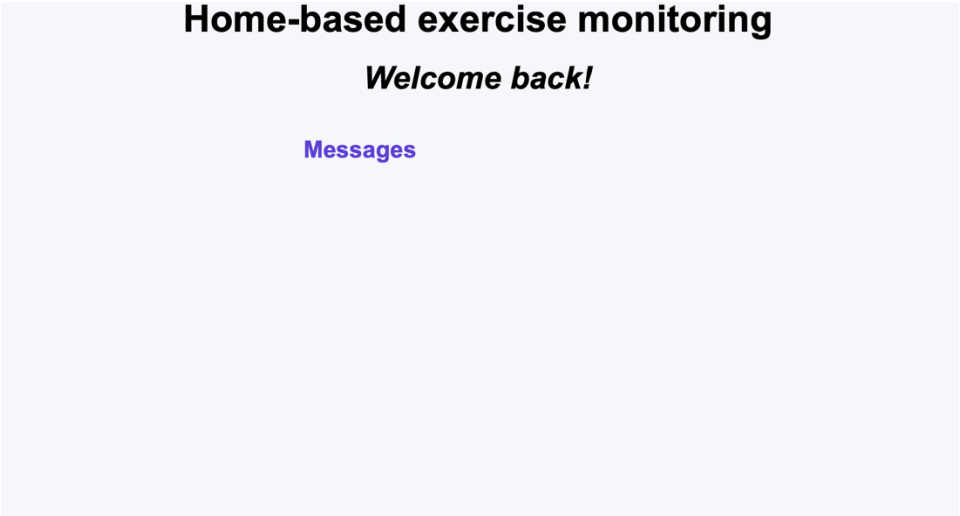

Figure A.18. 'Patients – Home' page without the 'Send a message' heading and box

6. Click the 'Navigator' icon again to close it.

7. Now, let's modify the display of the remaining elements on the page: **Click on the 'Container Messaging System'** (Figure A.19) to select it.

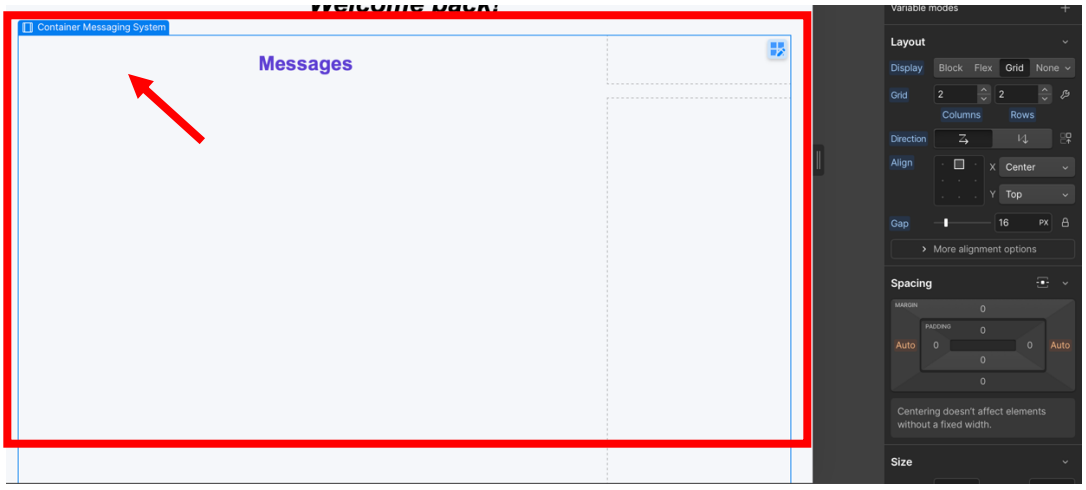

Figure A.19. Selecting the 'Container Messaging System'

8. In the right panel, click ***Style*** to see the Style settings.

9. Then, change the **'Layout' settings**:
   - In 'Display', select **'Flex'**. (Step 1 – Figure A.20)
   - In 'Direction', choose '↓'. (Step 2 – Figure A.20)
   - In the **'x'** section of the 'Align' settings, choose **'Center'**. (Step 3 – Figure A.20)

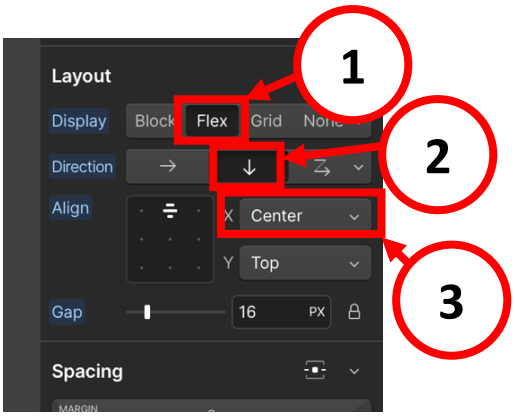

Figure A.20. Modifying the layout of the 'Container Messaging System'

10. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

11. Perfect! You have successfully removed the patient's ability to send messages. Now, if you log into the website as a patient, you won't be able to send messages.

Note: If you arrived here while following Example 1, click here to return to Example 1.

3.2. Remove the messaging system

To remove entirely the messaging system, we will need to:
- Remove the patient's messaging system (in the 'Patients – Home' page)
- Remove the staff's messaging system (in the 'Staff – Home' page)

1. Open your site in Webflow. In the left menu, click on the **'Pages' icon**.

2. Click on the ***Patients – Home*** page.

3. Click on the 'Container Messaging System' to select it (Figure A.21).

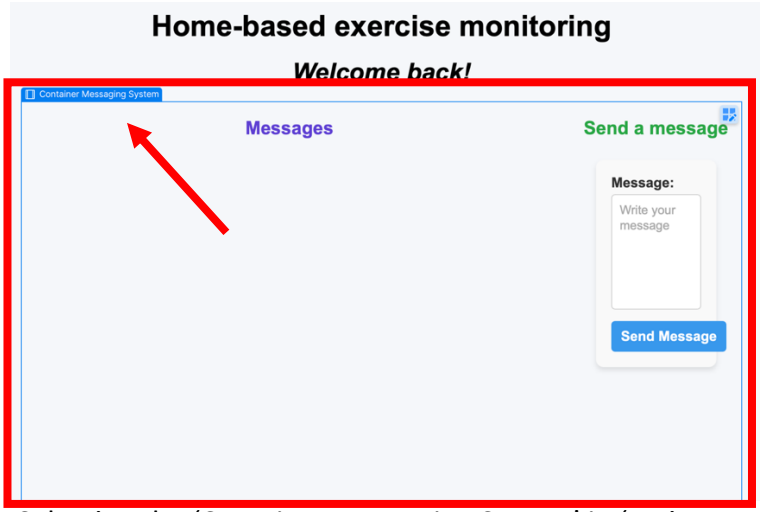

Figure A.21. Selecting the 'Container Messaging System' in 'Patients – Home' page

4. Once the container is selected, **right-click and** select the option ***Delete***.

5. In the left menu, click on the **'Pages' icon**.

6. Now, click on the ***Staff – Home*** page.

7. Click on the **'Container Messaging System Staff'** to select it (Figure A.22).

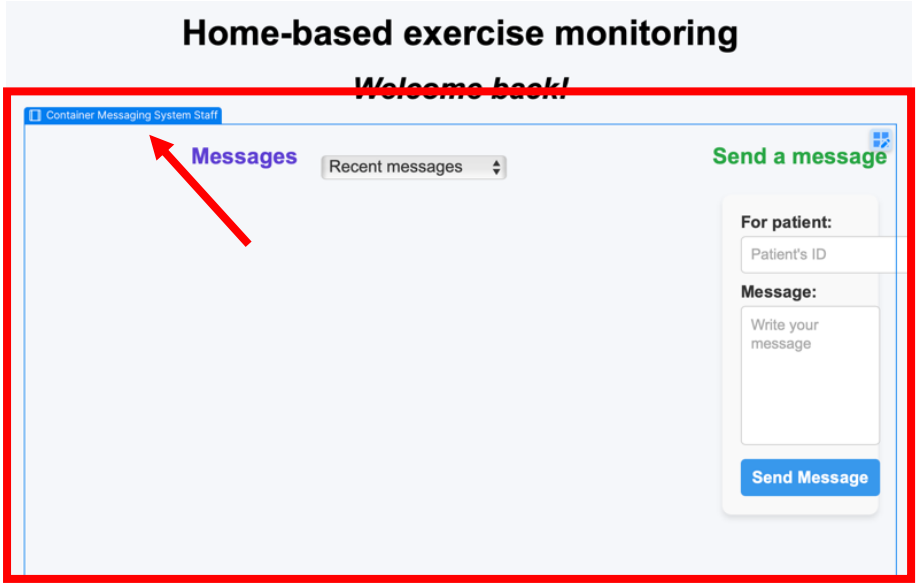

Figure A.22. Selecting the 'Container Messaging System Staff' in 'Staff – Home' page

8. Then, **right-click and** select the option ***Delete*.**

9. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

10. Perfect, now both messaging systems have been deleted!

4. Modifying the form (level of difficulty: **4**/5)

Before making any kind of changes to the form, read section 4.1. Explaining the form's behaviour.

4.1. Explaining the form's behaviour

The form on the ***Patients – Enter data*** page (Figure A.23) is what allows patients to submit their daily information.

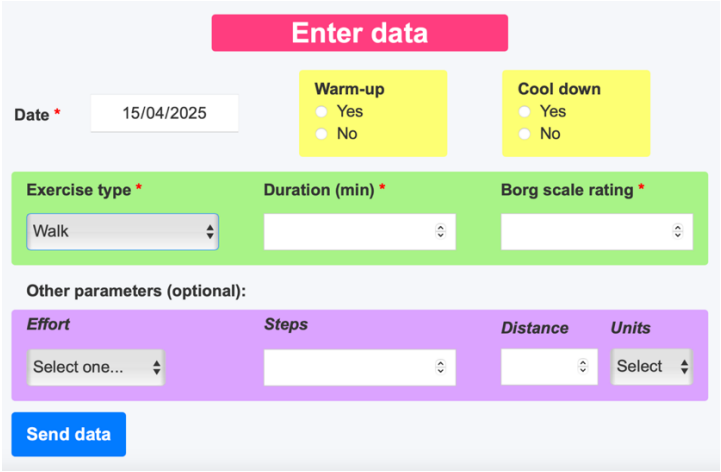

Figure A.23. Form in 'Patients – Enter data' page

The form can be modified, but here are some **key things to know** first:

1) **Required fields**
   The following fields must be filled to be able to submit the form:
   - Date
   - Exercise type
   - Duration (min)
   - Borg scale rating

   A required field can be changed to optional, or other fields can be made required. See section ***4.2. Managing Required Fields*** for more details.

2) **Graph connected fields**
   The values entered in these fields are used to generate graphs on the ***Patients – My track*** and ***Staff – My patients*** pages:
   - Duration (min)
   - Borg scale rating
   - Distance

   If not interested in tracking one of these values, you can:
   - Delete the field from the form (see section ***4.5. Deleting a field***)
   - And delete the matching graph in the patients and staff interface (see section ***5.2. Deleting a graph***)

Or, if interested in tracking a different numerical value, you can modify the 'Duration (min)' or 'Borg scale rating' fields (see section ***Modifying a field***).

Lastly, if interested in tracking the data but not displaying it in a graph, you can delete the graph and leave the field (see section ***5.2. Deleting a graph***).

Important: The **'Distance' field is different**. It is the only field that cannot be modified, it **must track distance**. So, if you do not want to track distance, you should:

- Delete the **Distance field** from the form (see section ***4.5. Deleting a field***)
- Delete the **Units field** from the form (see section ***4.5. Deleting a field***)
- Delete the **Distance graph** in ***Patients – My track*** and ***Staff – My patients*** (see section ***5.2. Deleting a graph***)
- Delete the **Units filter** from ***Patients – My track*** and ***Staff – My patients*** pages (see section ***5.3. Deleting a filter***)

3) Exercise Type Field

The options inside Exercise type dropdown **generate the activity buttons** in ***Patients – My track*** and ***Staff – My patients*** pages.

- The options in the Exercise type dropdown can be modified (See section ***Editing Exercise Type Options***)
- When the 'Other' option from the dropdown is selected, the 'Other activity name' field appears for the user to fill in (Figure A.24).

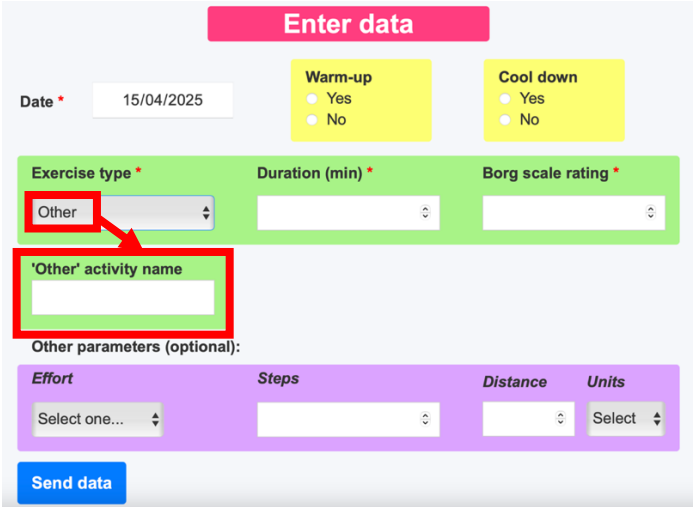

Figure A.24. Form in 'Patients – Enter data' page when 'Other' in 'Exercise type' is selected

- If needed, the Exercise Type field can be deleted (see section ***Deleting Exercise Type Field***).

4) Do not add new fields in the form. Instead, **modify or delete the existing fields** as necessary.

4.2. Managing Required fields

The required fields in the form are (Figure A.25):

- *'Date'*
- *'Exercise type'*
- *'Duration (min)'*
- *'Borg Scale Rating'*

These are the fields that the user must fill out to submit the form. They are also marked with a red asterisk (*) to show that they are mandatory.

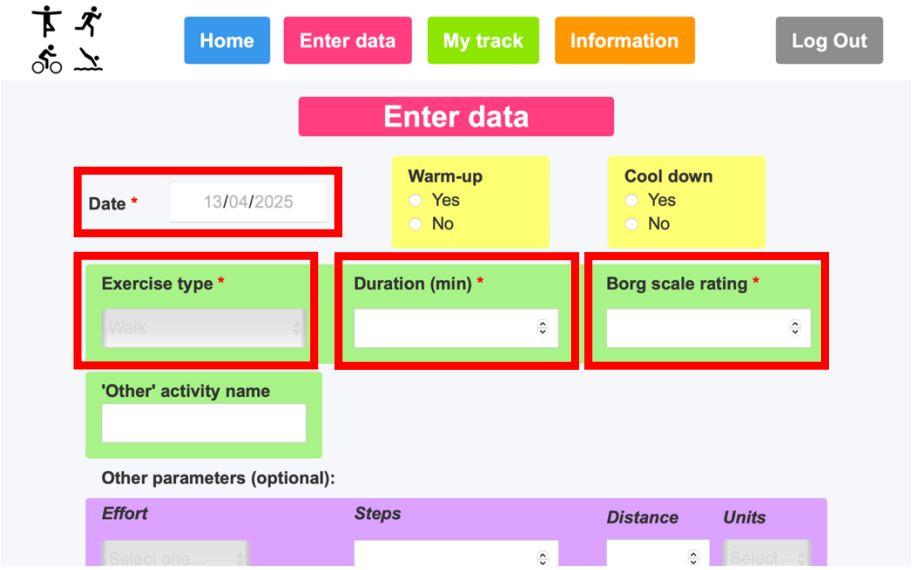

Figure A.25. 'Enter data' page with required fields marked

How to make a field required

1. Open your site in Webflow. In the left menu, click on the **'Pages'** icon.

2. Go to the ***Patients – Enter data*** page.

3. **Click on the 'box' of the field** you would like to make required (Step 1 – Figure A.26).

4. In the right menu, go to ***Settings*** (Step 2 – Figure A.26).

5. Then, check the option ***Required*** (Step 3 – Figure A.26).

Figure A.26. Making a field in the form required

6. Perfect! Now, **double-click** on the **label** on top of the field:
- And **write an asterisk (*)**, to let know the users that the field is required.
- Then, **select the asterisk** and click in the **brush icon** (Figure A.27).

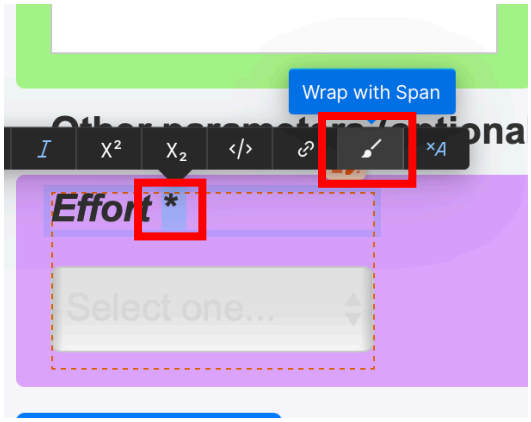

Figure A.27. Selecting the asterisk in the label

7. A 'Text Span' will be created to customize the asterisk:
- In the **Style** section of the right menu write **'Text Span' (Figure A.28)**
- And **the asterisk will turn red** like the other asterisks in the form.

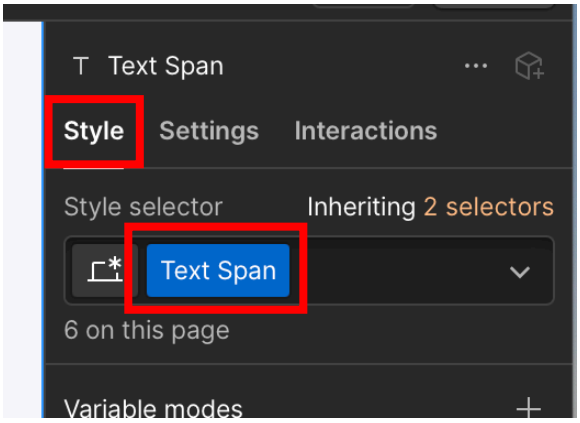

Figure A.28. Styling the asterisk in red

8. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

9. Go to Xano and login.

10. Click on ***Database*** in the left menu.
    Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

11. Then, click on the **'data_entries'** table.

12. Find the **column that matches the field** you made **required**.

13. **Right-click** on the name of the column and click on ***Settings***.

14. Scroll down the settings until you see the 'API configuration' section and enable **'Required'**. Then click on **'Update Column' (Figure A.29)**.

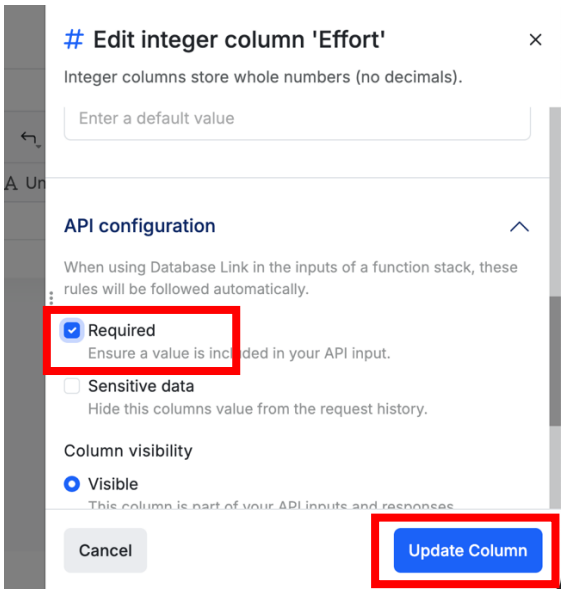

Figure A.29. Making required the corresponding column of the field in Xano.

15. Done! The field is now required.
    Note: If there are entries that do not have values in the field you made required, you will get a warning. To fix it, you can either add a value to those entries from Xano or delete them.

How to turn a required field into an optional one

1. Open your site in Webflow.

2. In the left menu, click on the **'Pages' icon**.

3. Click on the ***Patients – Enter data*** page.

4. **Click on the 'box' of the field** you would like to make optional (Step 1 – Figure A.30).

5. In the right menu, select ***Settings*** (Step 2 – Figure A.30).

6. Then, scroll down until you find ***'Required'*** and uncheck it (Step 3 – Figure A.30).

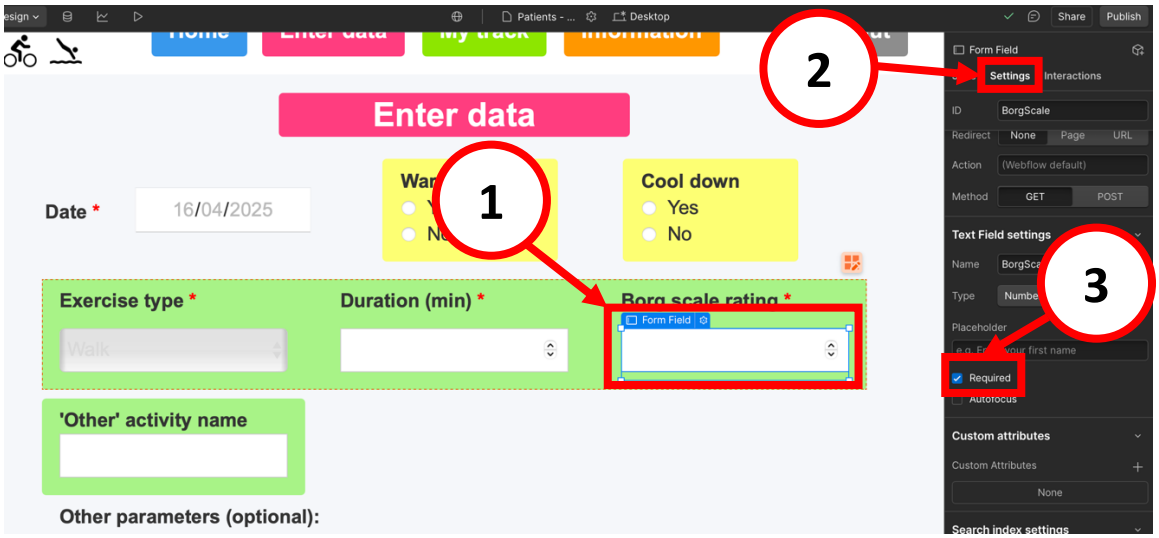

Figure A.30. Turning a required field in the form into an optional one

7. **Double click** on the **label** of the field to edit it, and **delete the red asterisk (*)**

8. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

9. Go to **Xano**. Click on ***Database*** in the left menu.
Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

10. Then, click on the **'data_entries'** table.

11. Find the **column that matches the field you made optional**.

12. **Right click** on the **name of the column** and click on ***Settings***.

13. Scroll down the settings until you see the 'API configuration' section and **uncheck *Required***. Then, click on ***Update Column*** (Figure A.31).

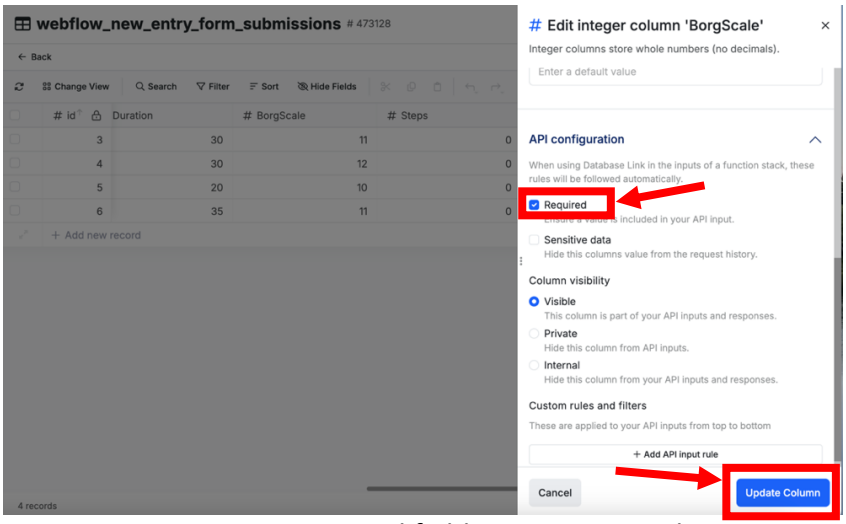

Figure A.31. Turning a required field into an optional one in Xano

14. Done! The field is now optional.

4.3. Managing the Exercise Type Field

Editing Exercise Type Options

The Exercise Type dropdown contains different options, which can be edited as follows:

1. In Webflow, click ***Open site*** to start editing your website (if you are not already doing so).

2. In the left menu, click on the **'Pages'** icon.

3. Click on ***Patients – Enter data***, to go to the 'Enter data' page.

4. **Double-click** the **'Exercise type' dropdown** to view its options (Figure A.32).

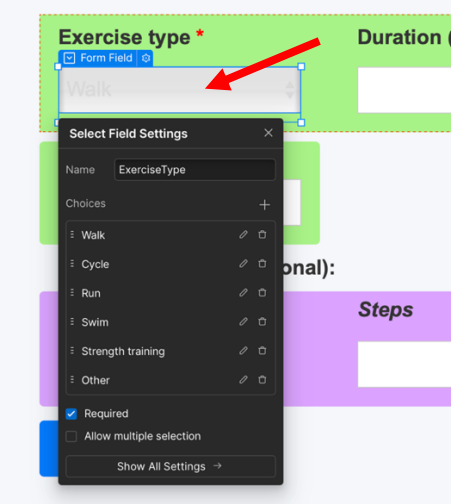

Figure A.32. Double-clicking on the 'Exercise type' dropdown

5. Now, follow the steps within:

- Step 5.1. – If you want to **add a new option**
- Step 5.2. – If you want to **delete an option**
- Step 5.3. – If you want to **manage the option named 'Other'** in the dropdown

5.1. **Add a new option:**

- Click the **'+' icon** next to Choices (Step 1 – Figure A.33).

- A new box will appear with empty **Text** and **Value** fields (Step 2 – Figure A.33).

- **Fill them in** with the new option, for example: *Text: Dance, Value: Dance*.
  - To save the option, click on any value in the list of Choices.
  - To reorder the options on the dropdown, drag the three-line icon next to the option (Figure A.34) to move it to another position (Figure A.35).

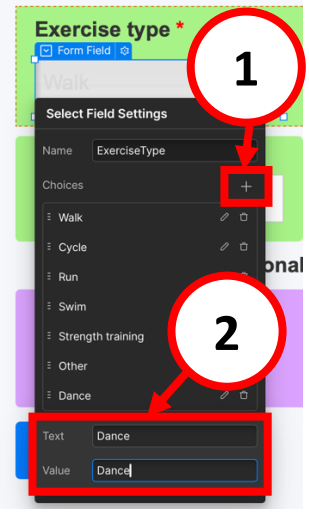

Figure A.33. Adding a new option in the Exercise type option

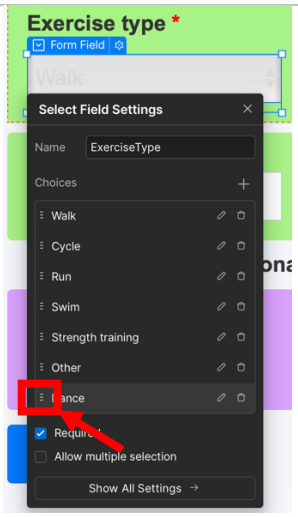

Figure A.34. Clicking on the three-line icon to move the option

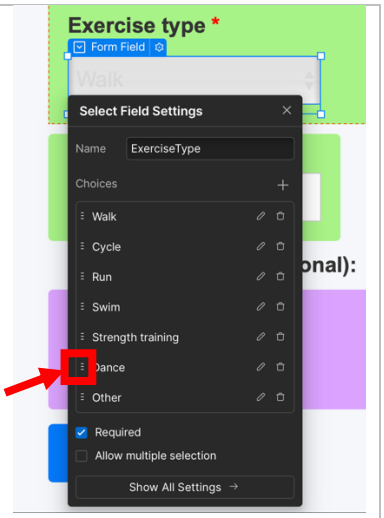

Figure A.35. Added option in a new position

- **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

- Great! You have added a new option in the Exercise Type drowdown.

  Note: If you arrived here while following Example 1, click here to return to Example 1.

5.2. **Delete an option:**

- Click on the **trash can icon next to the option** you want to delete (Figure A.36)

- **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

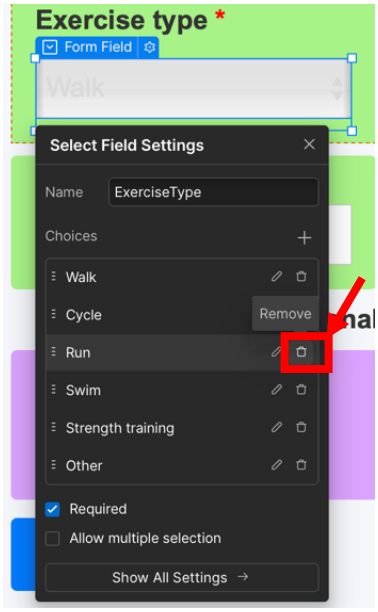

Figure A.36. Removing an option in the dropdown

- Now, go to Xano.

- In the left menu, click on **Database**.
  Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

- Click on the **'data_entries'** table.

- Delete all the existing entries:
  - **Check the box next to 'id'** (Step 1 – Figure A.37)
  - Click on ***Delete*** (Step 2 – Figure A.37)

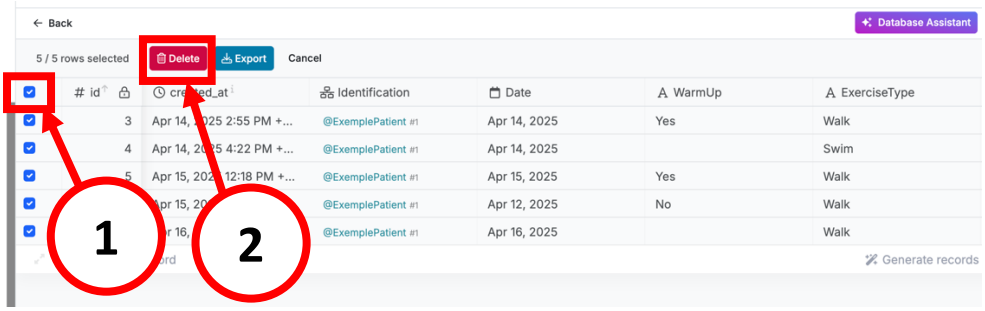

Figure A.37. Removing an option in the dropdown

Now, once new entries are submitted, the activity buttons on ***Patients – My track*** and ***Staff – My patients*** pages will be created with the updated dropdown options.

- Done! The option has been properly deleted from the dropdown.

5.3. **Manage the 'Other' option:**

When the **'Other' option is selected** in the dropdown of the website, **the field *'Other' activity name* appears** for the user to fill in.

If this extra field is not needed, you can:

a. Delete the 'Other' option from the dropdown

b. Delete the *'Other' activity name* from the form.
   Or, if you need a separate text field, delete the 'Other' option from the dropdown and modify the field (see section ***Modifying a field***).

Deleting Exercise Type Field

If you are not interested in having the Exercise type field in your website, because the information you want to track with *'Duration (min)'* and *'Borg scale rating'* fields does not need to be filtered with buttons, you can delete it by following the next steps:

1. Open your site in Webflow. In the left menu, click on the **'Pages'** icon.

2. Click on the ***Patients – Enter data*** page.

3. **Right-click** on the **'Exercise type' select field** in the form (**Figure A.38**).
- Then, select ***Delete***.

4. **Right-click** on the **Exercise Type field label** (Figure A.39)
- Then, select ***Delete***.

Note: If you have trouble selecting the Exercise Type label, click the green container and temporarily change its display to 'Block' (right panel). After deleting it, switch the display setting back to its original layout ('Grid').

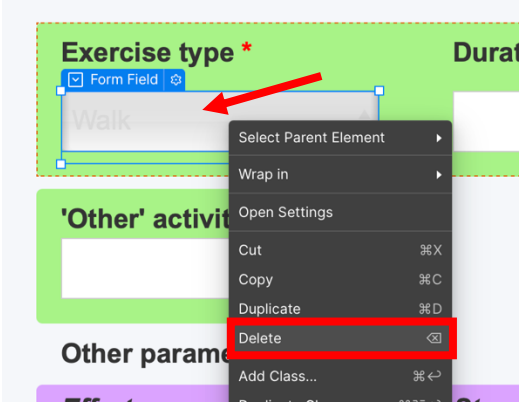

Figure A.38. Deleting the Exercise type select field on 'Patients – Enter data'

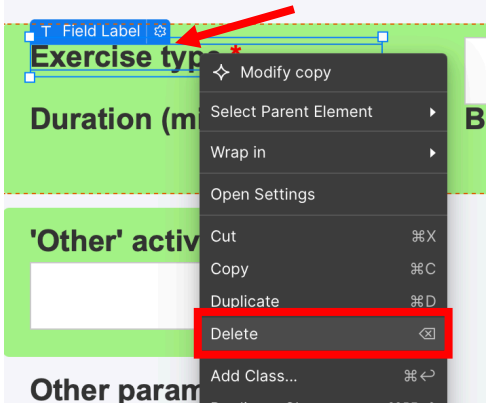

Figure A.39. Deleting the Exercise type label on 'Patients – Enter data'

5. Your form should now look like the one in **Figure A.40**.

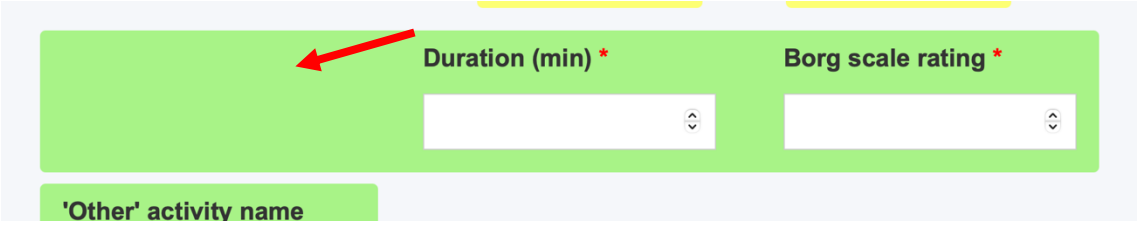

Figure A.40. Form without the *Exercise Type* field and label

6. Now, let's reorder the form so it looks better visually:

- Click on the **label *Duration (min)* (Step 1 – Figure A.41)**

- On the right panel, click the **'Style' tab (Step 2 – Figure A.41)**

- Under *Position*, set ***Column start* and *end* to 1 and 1 (Step 3 – Figure A.41)**

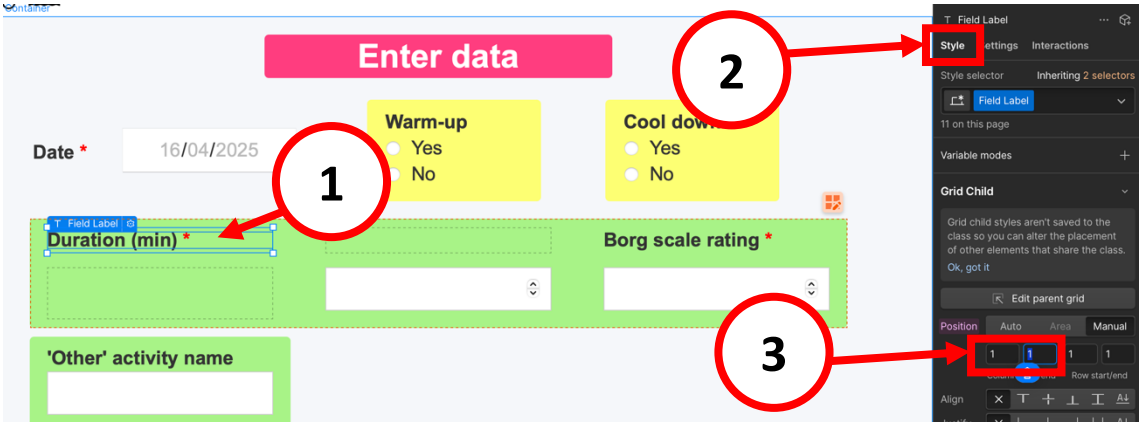

Figure A.41. Moving the *Duration (min)* field label

- Click on the **field that was below *Duration (min)*** and do the same:
  - In the 'Style' tab, change its ***Column start/end*** to **1** and **1** as well.

- Next, click on the ***Borg scale rating* label**:
  - Go to **'Style'** and set its ***Column start/end*** to **2** and **2**.

- Do the same for the ***Borg scale rating* field**:
  - Click on it, go to **'Style'**, and set its ***Column start/end*** to **2** and **2**.

- Your form should now look like the one in **Figure A.42**.

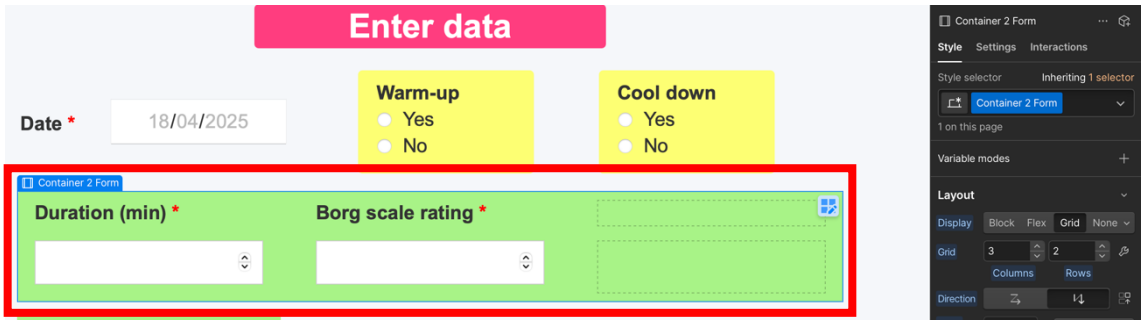

Figure A.42. Reordered form without the Exercise Type select field

7. Lastly, click on the green container named **'Container 2 Form'**:
- And, on the **Style** settings of the right panel:
    - Change the Grid Layout to **2 columns**, as shown in **Figure A.43**.

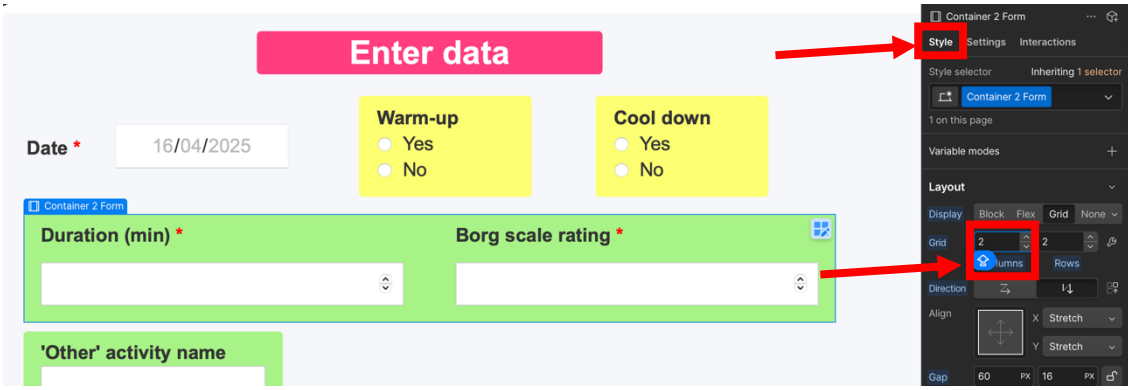

Figure A.43. Changing the layout to two columns

8. Perfect! Now, in the left menu, click on the **'Pages'** icon.

9. Click on the ***Patients – My track*** page.

10. Find the container named **'Container Activity Buttons'** (Figure A.44).
- **Right click** on it.
- And select ***Delete***.

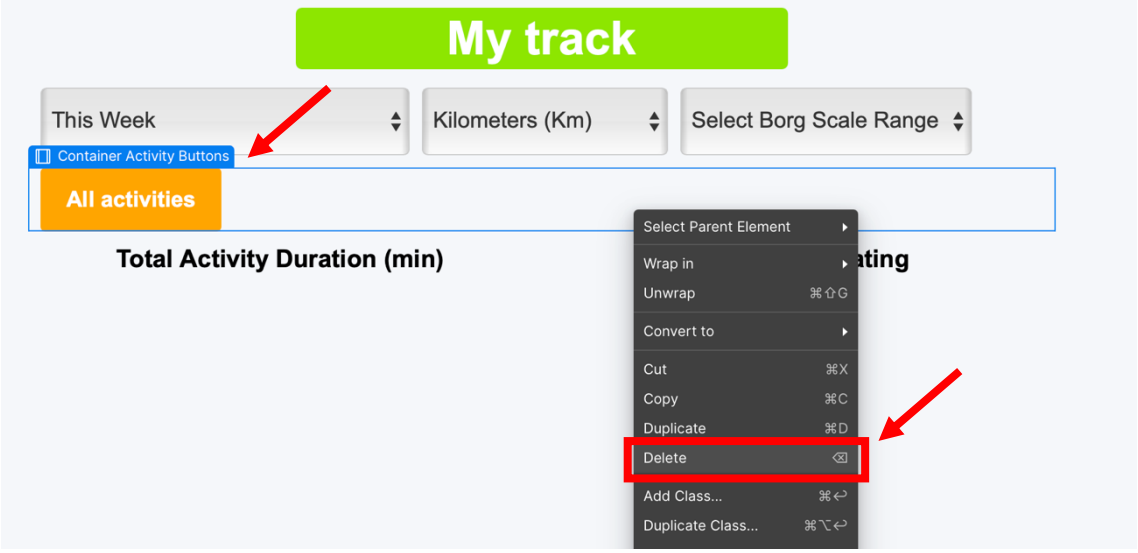

Figure A.44. Deleting the 'Container Activity Buttons' container

11. In the left menu, click on the **'Pages'** icon.

12. Click on the ***Staff – My patients*** page.

13. Again, find the container named **'Container Activity Buttons'**:
- **Right-click** it.
- And select ***Delete***.

14. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

15. Perfect! Now, go to **Xano**. From the left menu, select ***Database***.
Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

16. Click on the **'data_entries'** table.

17. Locate the **ExerciseType** column (**Figure A.45**).

18. **Right-click** on the name of the column (**Figure A.45**).
- Then, select ***Delete***.

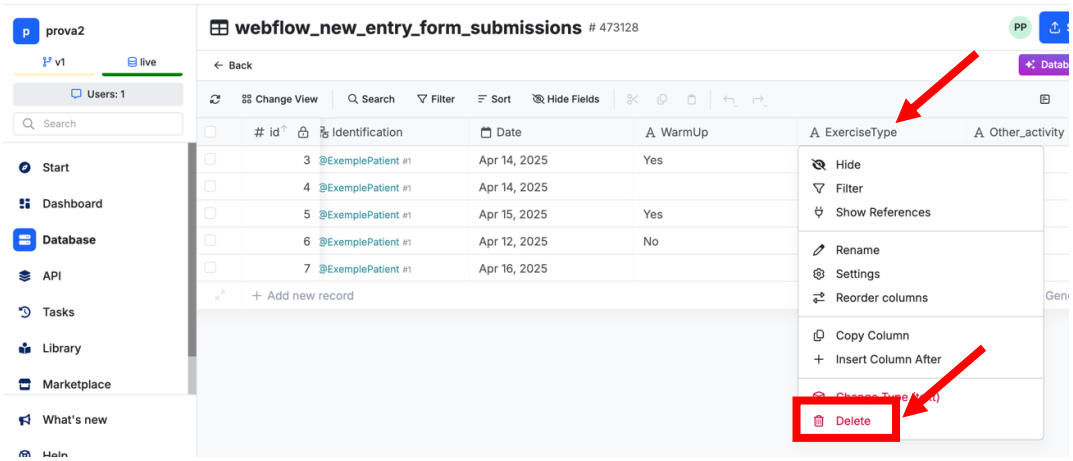

Figure A.45. Deleting the ExerciseType column in Xano

19. Done! You have successfully completely deleted the ExerciseType field.

4.4. Changing the remaining fields

Modifying a field

The fields of the form can be modified to track something else. To do so, follow the next steps:

1. Open your site in **Webflow**. In the left menu, click on the **'Pages'** icon.

2. Click on the ***Patients – Enter data*** page.

3. **Double-click on name of field** you would like to change (Figure A.46).
- Then, delete the text of existing label and **type in the new label** (Figure A.47).

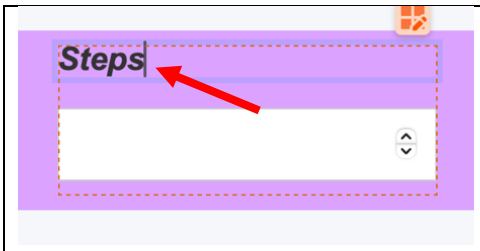

Figure A.46. Double-clicking on a field label to edit it

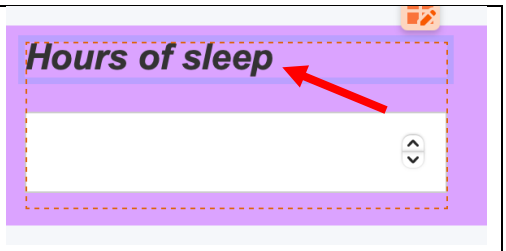

Figure A.47. Typing the new label of an existing field

4. Perfect! Now, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

5. Now, only follow the steps below if you are modifying a field other than 'Duration', 'Borg Scale', 'Distance', or 'Units'. If you modified one of those fields, you have already completed the necessary changes.

6. Let's change the name of that field in the database. To do so, go to **Xano**.

7. In the left menu, click on **Database**.
   Note: If you do not find 'Database' because you have just logged into Xano, click on 'Free Instance' to get to where we are.

8. Then, click on the **'data_entries'** table.

9. Look for the **column** that corresponds to the field name you have just changed on the form.

10. **Right-click** on the **name of that column**.

11. Select ***Rename*** (Figure A.48).

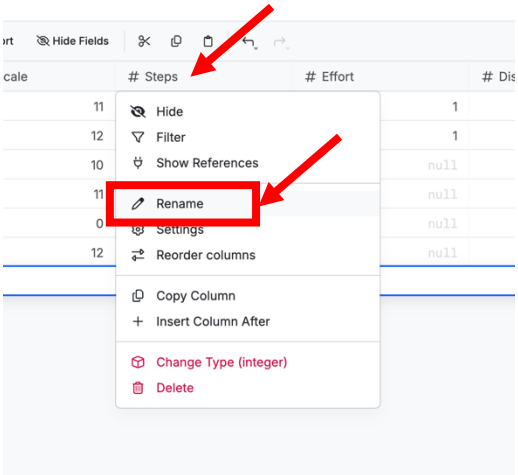

Figure A.48. Renaming the column matching the field changed

12. **Rename it** to something that reflects what the new field tracks.
*Note: **Do not use black spaces in the name**.*
E.g. Use 'HoursSleep' instead of 'Hours of sleep'.

- A confirmation banner will appear. Click **'Confirm'**.

- Then, a tab will open on the right. Click **'Update references'** (Figure A.49).

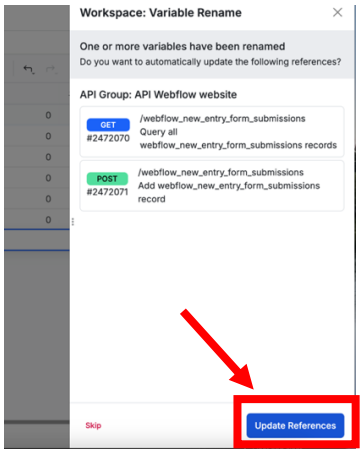

Figure A.49. New tab after confirmation banner

13. Great! Now, while still in Xano:
- Click on **API** in the left menu (Step 1 – Figure A.50).

14. Then, click on the folder named **'API Webflow website'** (Step 2 - Figure A.50).

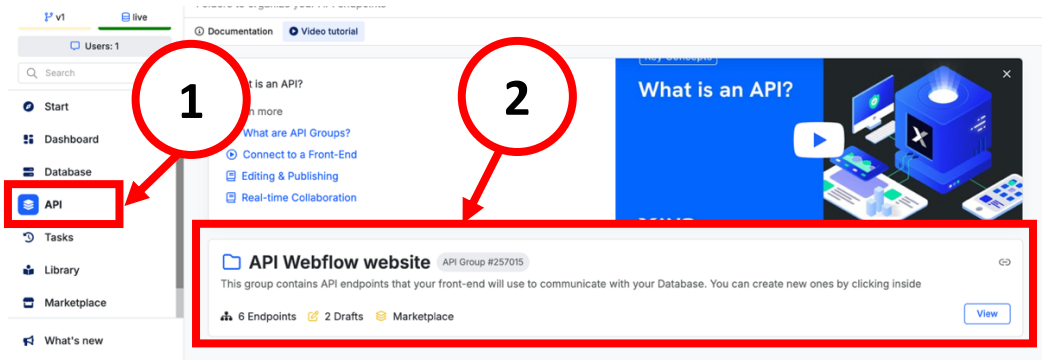

Figure A.50. Accessing the 'API Webflow website' folder in Xano

15. Inside the folder, there is a section named **'data_entries'**. In that section, you will see **POST data_entries** marked as ***'Draft'*** (Figure A.51).

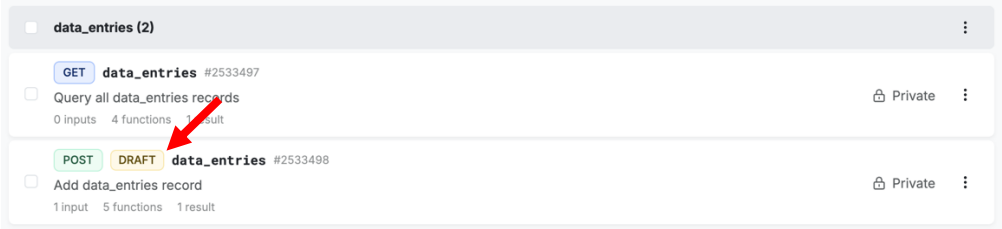

Figure A.51. Section 'data_entries' inside the 'API Webflow website' folder in Xano

16. Click on **POST data_entries**

17. Then, click on the **'Publish'** button **(Figure A.52).**

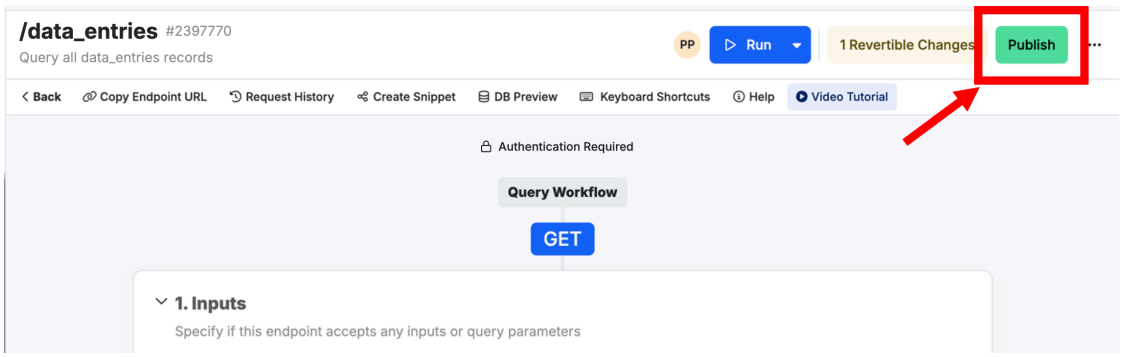

Figure A.52. 'Publish' button inside a subsection

18. A tab will appear in the right side of the screen.
- Click the **'Publish'** button again (See Figure A.53).

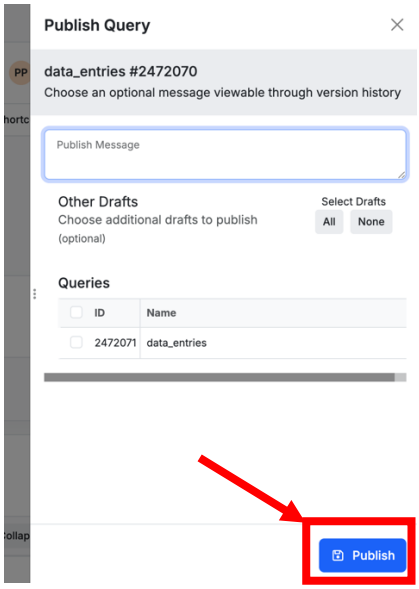

Figure A.53. 'Publish' button in the new tab

19. Return to the previous screen.

20. Congratulations! You have successfully modified a field in the form.

Changing a field to an open text field

1. Open your site in **Webflow**. In the left menu, click on the **'Pages'** icon.

2. Click on the ***Patients – Enter data*** page.

3. **Double-click on name of field** you would like to turn into an open text field.
- Then, delete the text of existing label and **type in the new label (Figure A.54)**.

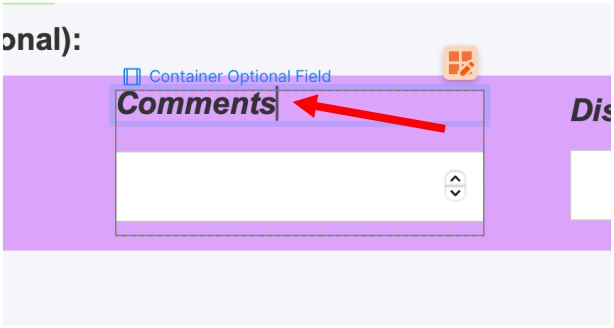

Figure A.54. Typing the new label of an existing field

4. Now, **click the field** you would like to turn into an open text field (Step 1 - Figure A.55).
Note: You can only perform this action on fields that are currently set to a numerical type.

- On the ***Settings*** of the right panel (Step 2 - Figure A.55), scroll down to the '*Text Field settings'* section.
- Then, next to ***Type***, select ***Plain*** (Step 3 – Figure A.55).
Note: It is very important that you only change the Type setting, do not modify anything else in Settings section.

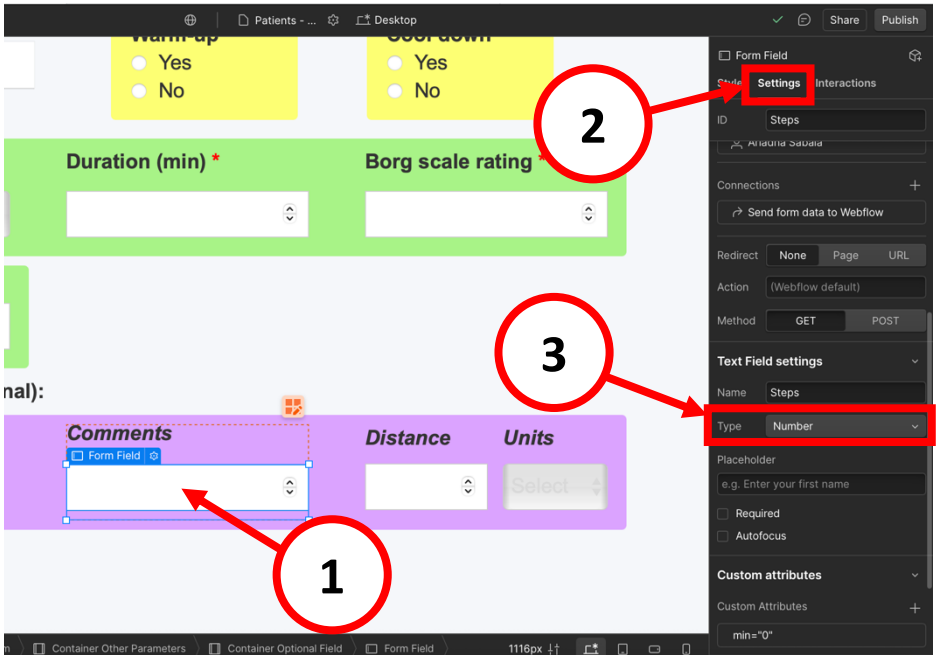

Figure A.55. Changing a field's Type

5. Perfect! Now, **publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

6. Now, go to **Xano**.

7. In the left menu, click on **Database**.

8. Then, click on the **'data_entries'** table.

9. Look for the **column** that corresponds to the field name you have just changed on the form.

10. **Right-click** on the **name of that column** and select ***Rename*** (Figure A.56).

- **Rename it** to something that reflects what the new field tracks.
  *Note: **Do not use black spaces in the name**.*
  E.g. Use 'HoursSleep' instead of 'Hours of sleep'.

- A confirmation banner will appear. Click **'Confirm'**.

- Then, a tab will open on the right. Click **'Update references'**

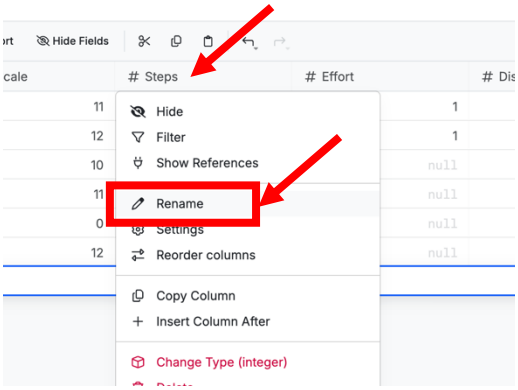

Figure A.56. Renaming the column matching the field changed

11. **Right-click again** the **name of the same column** (now renamed):
- And select ***Change Type (integer)*** (Figure A.57).
- Change it to ***text*** (Figure A.58).
- Click ***Save*** (Figure A.58).

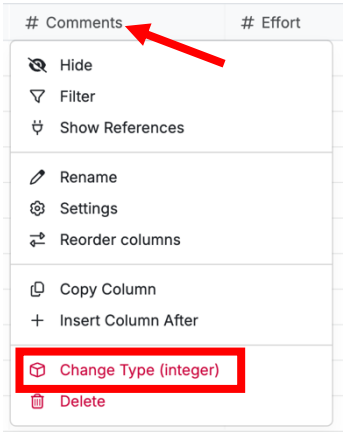

Figure A.57. Selecting 'Change Type (integer)

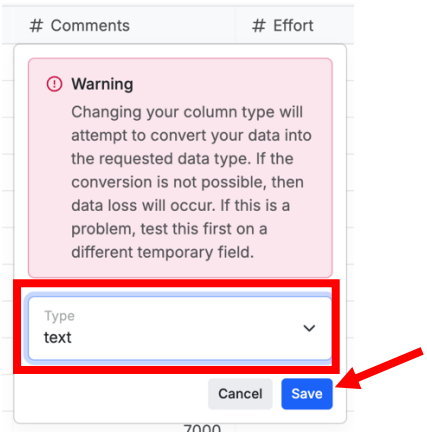

Figure A.58. Changing Type to 'text'

12. Great! Now, while still in Xano:
- Click on **API** in the left menu (Step 1 – Figure A.59).

13. Then, click on the folder named **'API Webflow website'** (Step 2 - Figure A.59).

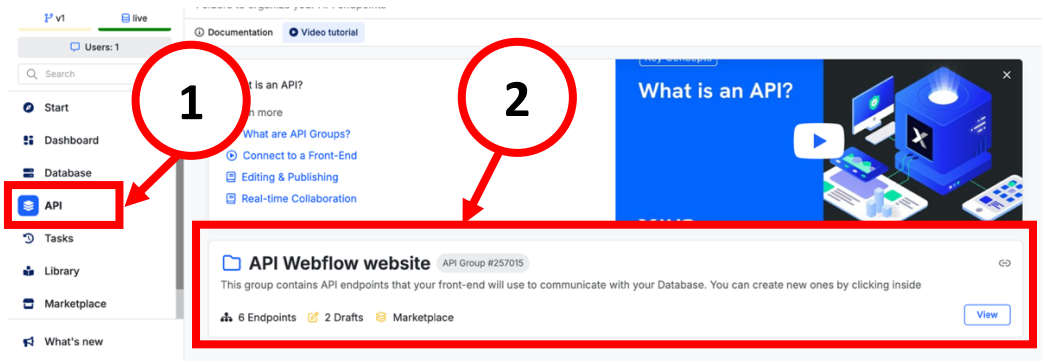

Figure A.59. Accessing the 'API Webflow website' folder in Xano

14. Inside the folder, there is a section named **'data_entries'**. In that section, you will see **POST data_entries** marked as ***'Draft'*** (Figure A.60).

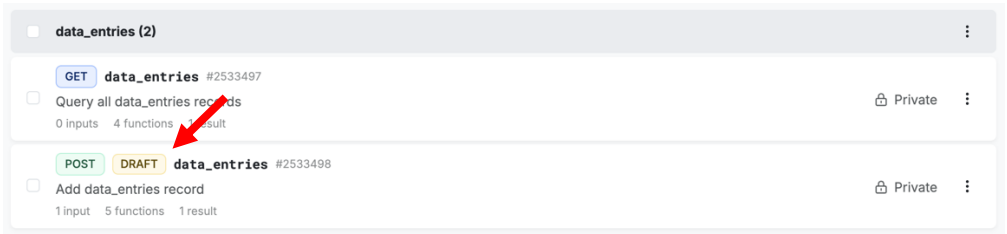

Figure A.60. Section 'data_entries' inside the 'API Webflow website' folder in Xano

15. Click on **POST data_entries**.

16. Then, click on the **'Publish'** button **(Figure A.61).**

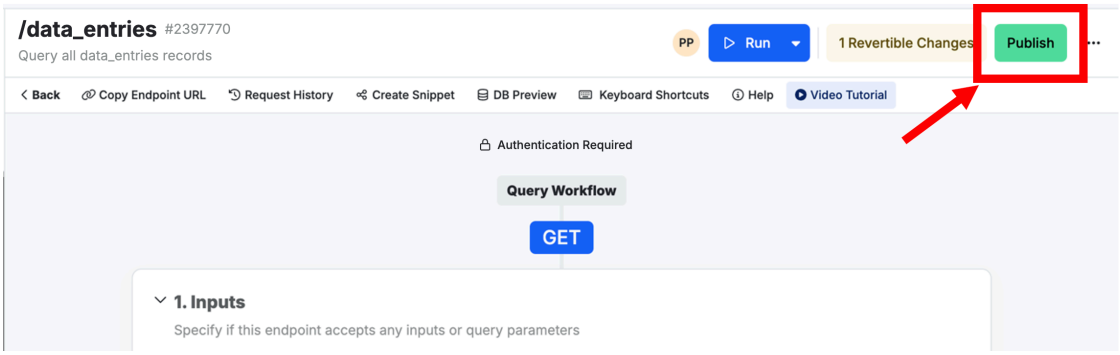

Figure A.61. 'Publish' button inside a subsection

17. A tab will appear in the right side of the screen.
- Click the **'Publish'** button again.
(See Figure A.62)

18. Return to the previous screen.

19. **Congratulations!** You have successfully changed a field to an open text field.

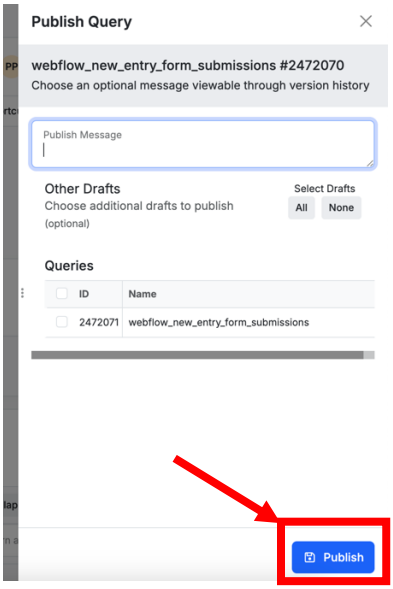

Figure A.62. 'Publish' button in the new tab

4.5. Deleting a field

1. Open your site in **Webflow**. In the left menu, click on the **'Pages'** icon.

2. Click on the ***Patients – Enter data*** page.

3. Locate the question you want to delete:

- If its inside a container, **right-click the container** and select **'Delete'** (Figure A.63 and Figure A.64).

- If it is not in a container, delete both the **'Field Label' and the 'Form Field'** separately by **right clicking on each one** and selecting **'Delete'** (Figure A.65).

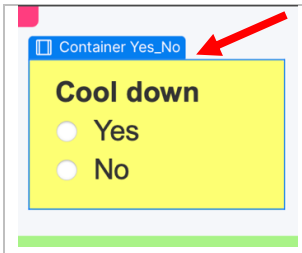

Figure A.63. 'Cool down' question inside a container

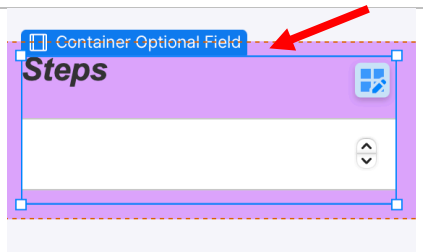

Figure A.64. 'Steps' question inside a container

Figure A.65. 'Borg scale rating' question separately – Field Label and Form Field.

4. Go to **Xano**.

5. From the left menu, select **Database**.

6. Click on the **'data_entries'** table.

7. **Find the column that matches the question you have just deleted** from the form. E.g. If you deleted the question 'Cool down', look for the column named 'CoolDown'.

8. **Right-click** on the title of that column and select ***Delete*** **(Figure A.66)**.

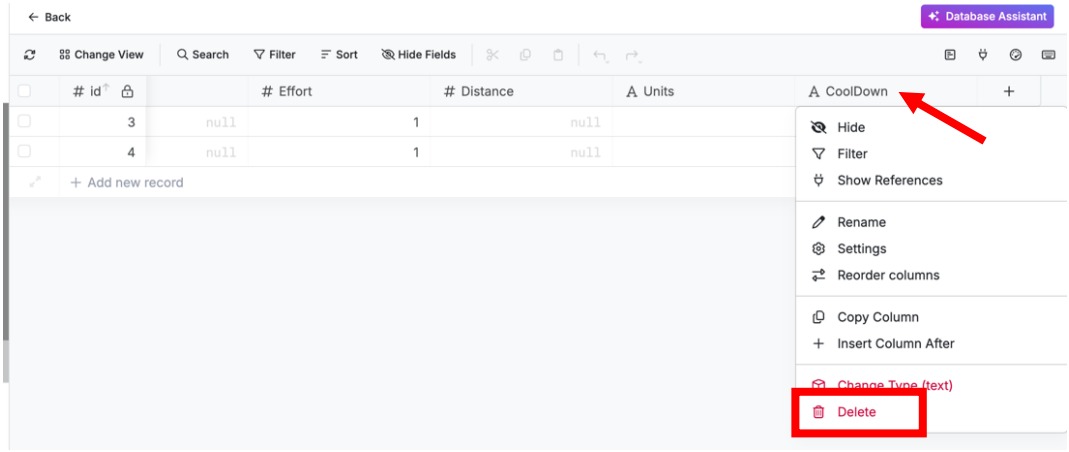

Figure A.66. Deleting the 'CoolDown' column in the 'data_entries' table

9. Select ***Delete*** again when the confirmation banner appears (Figure A.67)

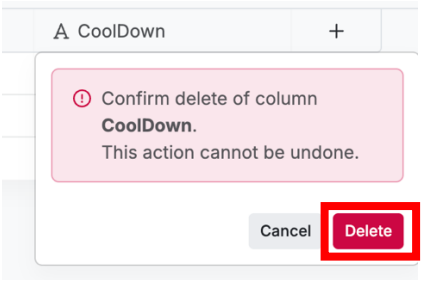

Figure A.67. Confirmation banner when deleting a column in the 'data_entries' table

10. And done! You have successfully removed a question from the form.

Important: If the field you delete is one that created a graph:

- Duration (min)
- Borg scale rating
- Distance
- Units

Then, you will also need to delete the corresponding graph from:

- ***Patients – My Track*** page
- ***Staff – My Patients*** page

Because they will no longer have data to display. To learn how to do it, go to section ***5.2. Deleting a graph.***

5. Modifying the graphs (level of difficulty: **2**/5)

There are three graphs in the 'My track' (patient's interface) and the 'My patients' page (staff's interface):

- 'Total Activity Duration (min)' graph
- 'Borg Scale Rating' graph
- 'Distance (*units*)' graph

5.1. Changing the title of a graph

Follow the next steps to change the title of a graph.

Note: It is not recommended to change the 'Distance (units)' graph title because this graph is specifically meant to track distances.

1. Go to Webflow. Make sure you are in 'Designer' mode.
2. In the left menu, click on the **'Pages' icon**.
3. Click on the ***Patients – My Track*** page.
4. **Double click on the title** you would like to modify (Figure A.68) and **change the title** as desired.

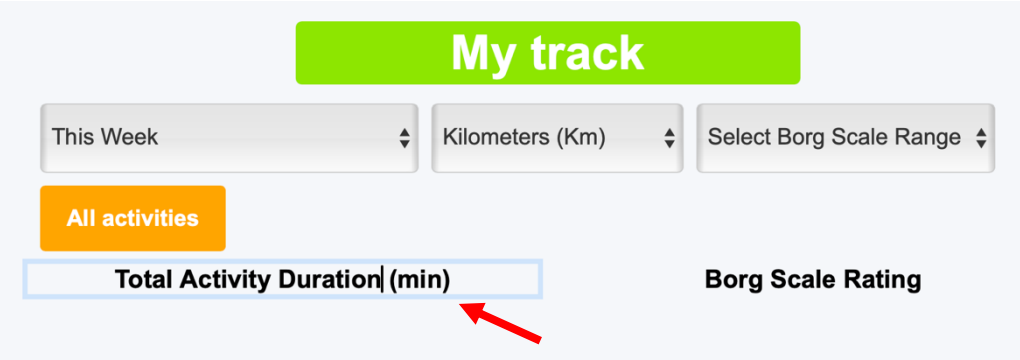

Figure A.68. Modifying the title of a graph

5. In the top-menu of the screen, change the display view to **'Mobile (L)'** (Figure A.69).
   This will allow us to update the mobile version of the title.

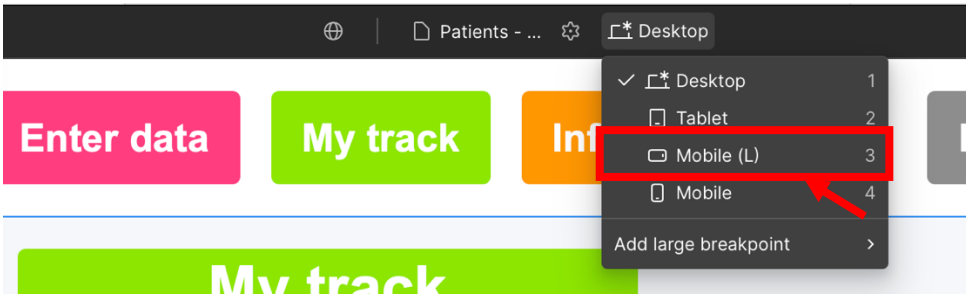

Figure A.69. Changing the display to 'Mobile (L)'

6. In the **Settings** of the right-menu:

- In the **Slider settings** section, use the **arrows (Step 1 – Figure A.70)** to change between slides **until you see the title you want to update**.

- Once you have found it, **double-click on the title (Step 2 – Figure A.70)** and change it to the same title you set earlier.

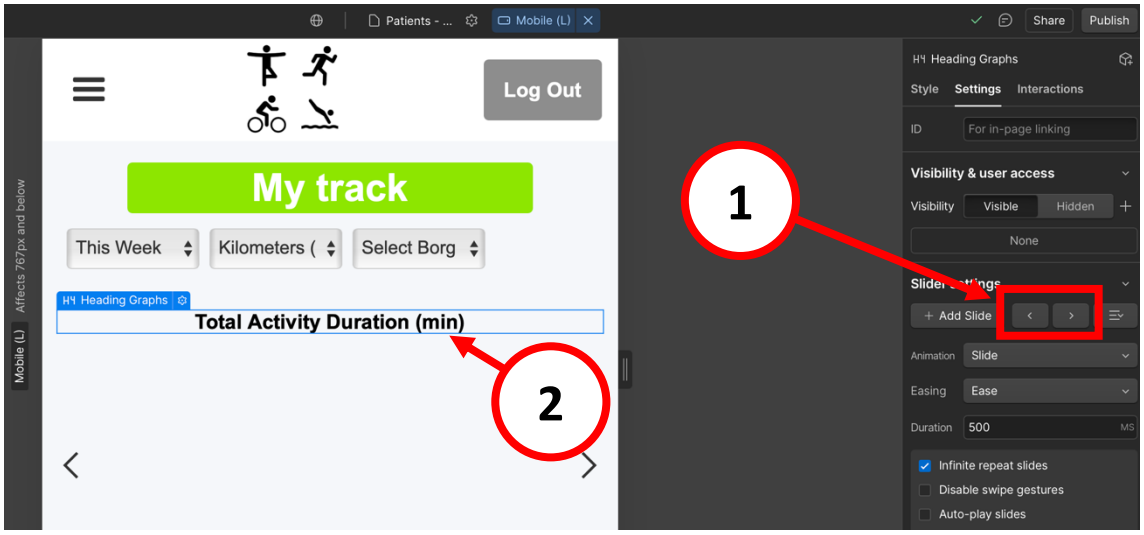

Figure A.70. Modifying the title of a graph in the mobile display view

7. **Click the 'X' next to 'Mobile (L)'** at the top of the screen to exit the mobile view.

8. Done! You have successfully changed the title of both the desktop and mobile views of the graph.

9. In the left menu, click on the **'Pages' icon**.

10. Click on the ***Staff – My Patients*** page and **repeat Steps 4 to 7 for this page**.

11. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

5.2. Deleting a graph

If there is a graph you are not interested in, it can be deleted by following these steps:

1. Go to Webflow. Make sure you are in 'Designer' mode.

2. In the left menu, click on the **'Pages' icon**.

3. Click on:

- ***Patients – My Track*** page: if you want to delete the graph from the **patient interface.**

- ***Staff – My Patients*** page: if you want to delete the graph from the **staff interface.**

- If you want to delete the graph from **both interfaces**: follow the next steps twice (first for the ***Patients – My Track*** page, and then for the ***Staff – My Patients*** page).

4. Once you are on the desired page:
- Click on the **Navigator icon** in the left-menu **(Step 1 – Figure A.71)**.

*Note: The Navigator contains the structure of the different elements that appear on the page. The **arrow icons (>)** are used to view the different components inside each element.*

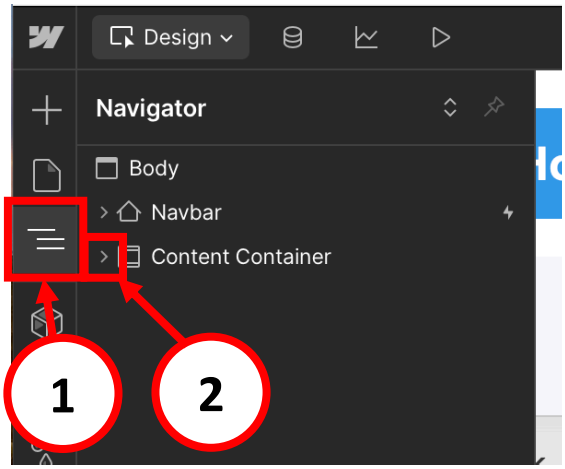

Figure A.71. Opening the Navigator menu

5. Click the **arrow icon (>)** next to **'Content Container'** (Step 2 - Figure A.71).

6. Click the **arrow icon (>)** next to **'Container Grid'** (Step 1 - Figure A.72).

Inside, you will see **three 'Container Graphs Grid' elements** (in blue - Figure A.72), each of them represents a graph in the desktop view:
- 1st 'Container Graphs Grid' → 'Total Activity Duration (min)' graph
- 2nd 'Container Graphs Grid' → 'Borg Scale Rating' graph
- 3rd 'Container Graphs Grid' → 'Distance (*units*)' graph

7. **Click on the 'Container Graphs Grid' that corresponds to the graph you want to delete** (Step 2 – Figure A.72).

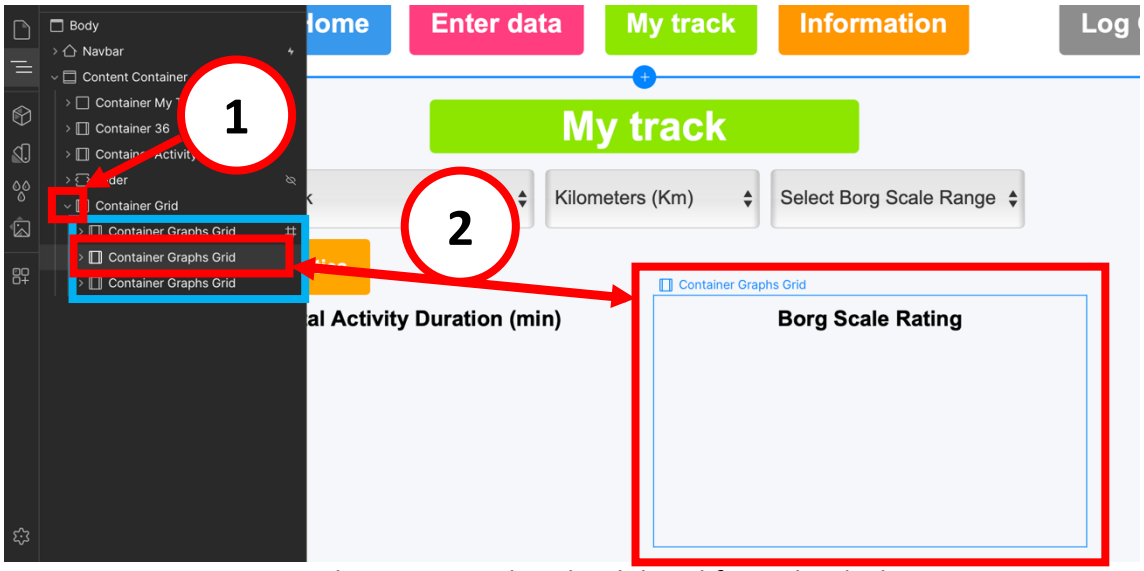

Figure A.72. Selecting a graph to be deleted from the desktop view

8. **Right-click** on it and select ***Delete*** (Figure A.73).

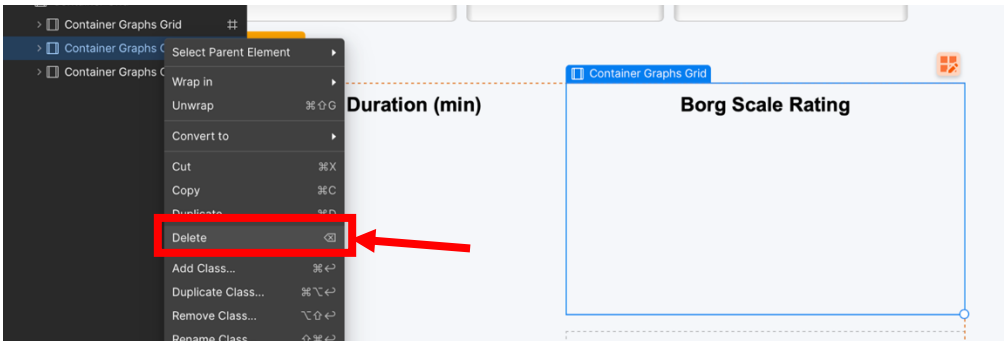

Figure A.73. Deleting a 'Container Graphs Grid'

9. Perfect. Now, let's delete the graph from the phone version of the website.
- On the **top menu**, switch the display view to **'Mobile (L)'** (Figure A.74).

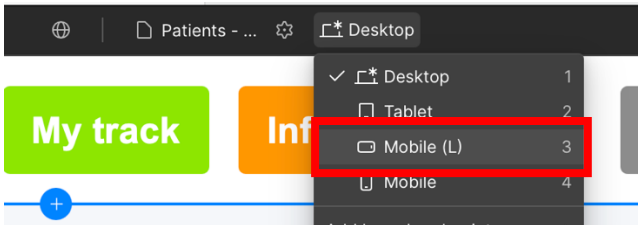

Figure A.74. Switching the display view to 'Mobile (L)'

10. In the Navigator panel:
- Click the **arrow icon (>)** next to **'Slider'** in the Navigator (Step 1 – Figure A.75).
- Then, click the **arrow icon (>)** next to **'Mask'** (Step 2 – Figure A.75).

You will see **three 'Slide _'**, each representing one of the mobile graphs:
- Slide 1 → 'Total Activity Duration (min)' graph
- Slide 2 → 'Borg Scale Rating' graph
- Slide 3 → 'Distance (*units*)' graph

11. **Right-click on the slide that matches the same graph you deleted in the desktop view** and select ***Delete*** (Step 3 – Figure A.75).

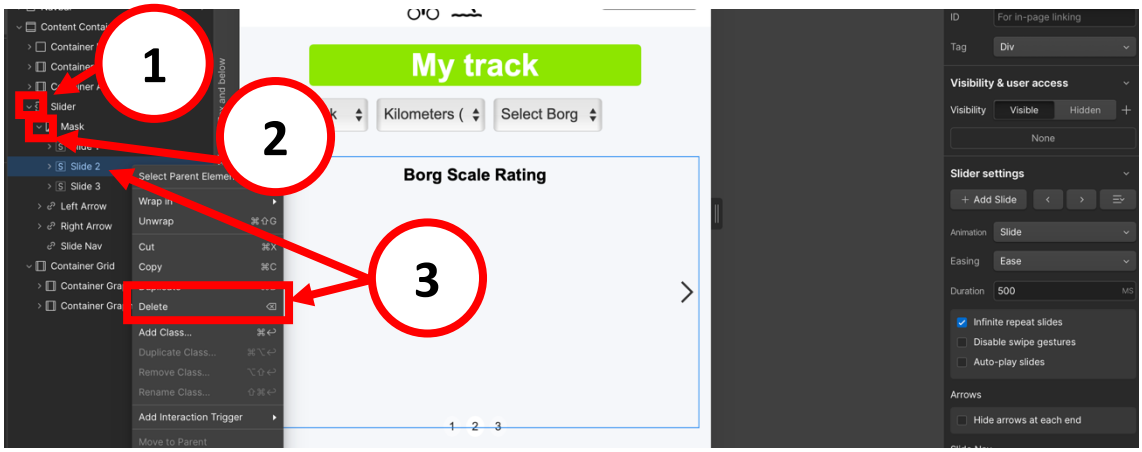

Figure A.75. Deleting a graph in mobile display view

12. **Click the 'X' next to 'Mobile (L)'** at the top of the screen to exit the mobile view.

13. Done! You have successfully removed the graph from both the desktop and mobile versions of the website.

14. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

5.3. Deleting a filter

On the 'My track' page (patient's view) and on the 'My patients' page (staff view) there are different filters used to view and sort the data of graphs in different ways.

The following filters (Figure A.76 and Figure A.77) can be removed if they are not useful for your website:

- ***'Kilometres/Meters/Miles'* filter**
- ***'Borg Scale Range'* filter**

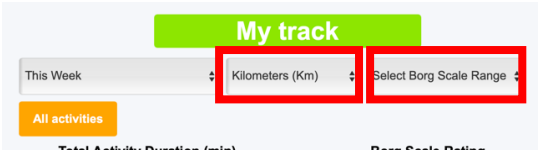

Figure A.76. Filters marked in red can be removed from the 'My track' page

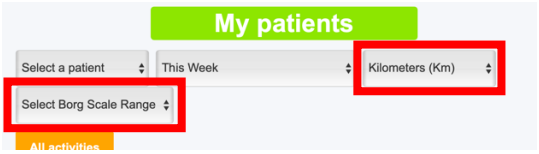

Figure A.77. Filters marked in red can be removed from the 'My patients' page

Important: The following filters cannot be deleted:

- *'Time filter (This Week, Last 2 Weeks, etc.)'* - appears in patients and staff pages.
- *'Select a patient'* filter - only appears in the staff page.

The next steps show how to remove a filter (**Figure A.76 and Figure A.77**):

1. In the left menu, click on the **'Pages' icon**.

2. Click on:

- ***Patients – My Track*** page: if you want to delete the filter from the **patient interface.**

- ***Staff – My Patients*** page: if you want to delete the filter from the **staff interface.**

- If you want to delete the filter from **both interfaces**: follow the next steps twice (first for the ***Patients – My Track*** page, and then for the ***Staff – My Patients*** page).

3. **Select the filter** you want to remove **by clicking on it** (Step 1 – Figure 78).

4. **Right-click** on it and select the ***Delete*** option (Step 2 – Figure A.78).

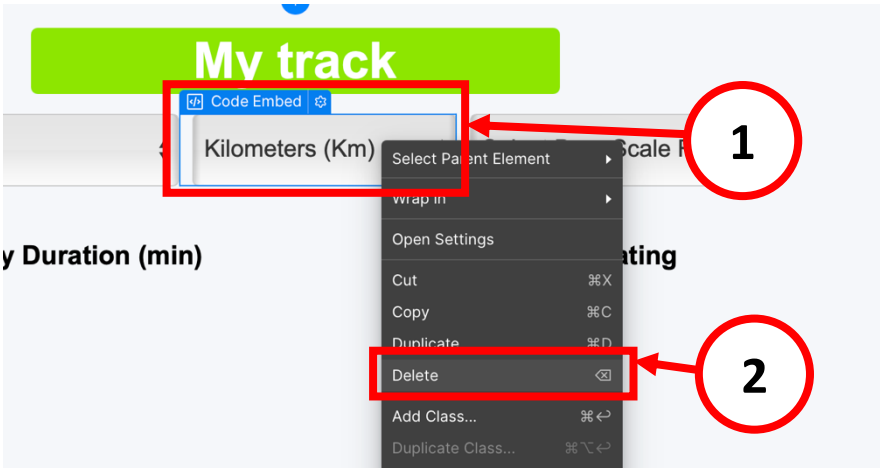

Figure A.78. Steps to delete a filter.

5. Done! The filter has been removed.

6. **Publish the website** to apply and save your changes (For detailed instructions, refer to section *4. Publishing the Website*).

Note: If you arrived here while following Example 2, click here to return to Example 2.

6. Deleting a User's Data (level of difficulty: **2**/5)

It's a good practice to conduct periodic reviews and remove patient information that is no longer needed to be stored online. Thus, this section shows how to delete a user's data.

For example:
If Patient 22 has completed their rehabilitation and staff members do no longer need to check their exercise data online, their data should be deleted from the database (from Xano). Or, if needed for other purposes, it can be saved locally (on a secure device) and then delete from the Cloud.

1. Log into **Xano**.

2. In the left menu, go to ***Database***.

3. Click on the **'data_entries'** table.

4. Select ***Filter*** (Step 1 – Figure A.79).

5. Click on ***+ Add filter*** (Step 2 – Figure A.79).
- Under Column, select ***Identification*** (Step 3 – Figure A.79).

- In **'Value'** field, **insert the ID of the patient** you would like to delete their entries. E.g. In our case, '22' (Step 3 – Figure A.79)

- Click ***Filter*** (Step 4 – Figure A.79)

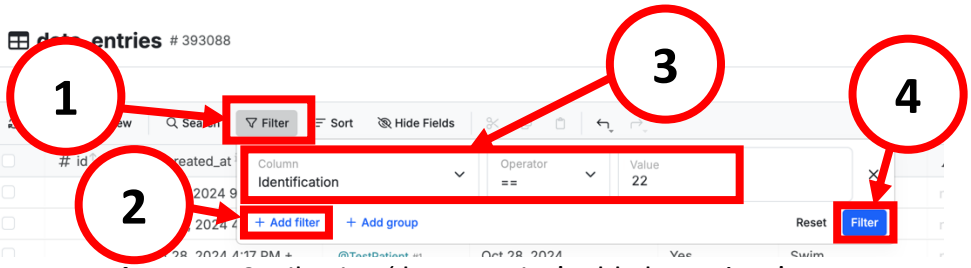

Figure A.79. Filtering 'data_entries' table by patient's ID

6. Now, only the data entries of this patient will appear on the screen.

- **Check the box next to '# id'** (Step 1 – Figure A.80) to select all entries of this patient.

- **If you prefer to store this data outside the database**:
  - Click ***Export*** (in blue – Figure A.80) to download the data as a CSV file.

  - Or, if you prefer to have the data in **Excel file**, log in to the published website as a staff member and download all data from this user from there.

- Delete the data by clicking ***Delete*** (Step 2 – Figure A.80)

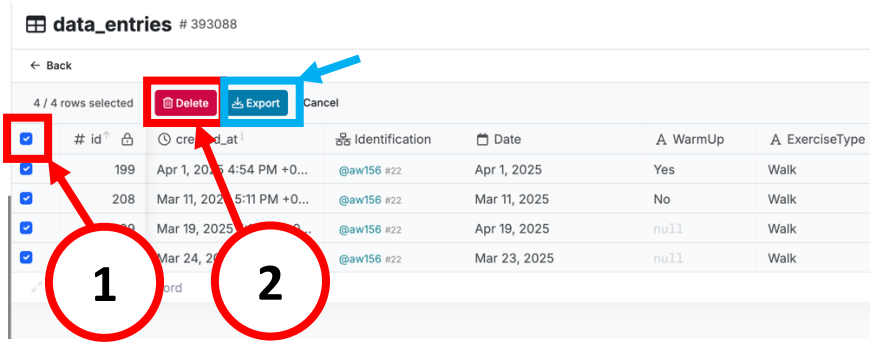

Figure A.80. Selecting all the filtered data entries and deleting them

7. Now, go back to ***Database*** (to the previous screen).

8. Click on the **'messages'** table.

9. Select ***Filter*** and click on ***+ Add filter***.
- Under Column, select ***sender_id***

- In **'Value'** field, **insert the ID of the patient** you would like to delete their sent messages entries. E.g. In our case, '22'.

- Click ***Filter***.

- **Check the box next to '# id'**, to select all sent messages of this patient.

- Delete them by clicking ***Delete***.

10. Change the filter by selecting ***receiver_id*** under Column.
- Apply it by clicking ***Filter***.

- **Check the box next to '# id'**, to select all the messages received by this patient.

- Click ***Delete***.

11. Remove the filter and go back to ***Database*** (to the previous screen).

12. Click on the **'user'** table.

13. **Locate the patient user you would like to delete:**
(In our case, Patient 22)

- **Check the box to the left** of the desired user's row (Step 1 – Figure A.81)

- Click ***Delete*** (Step 2 – Figure A.81)

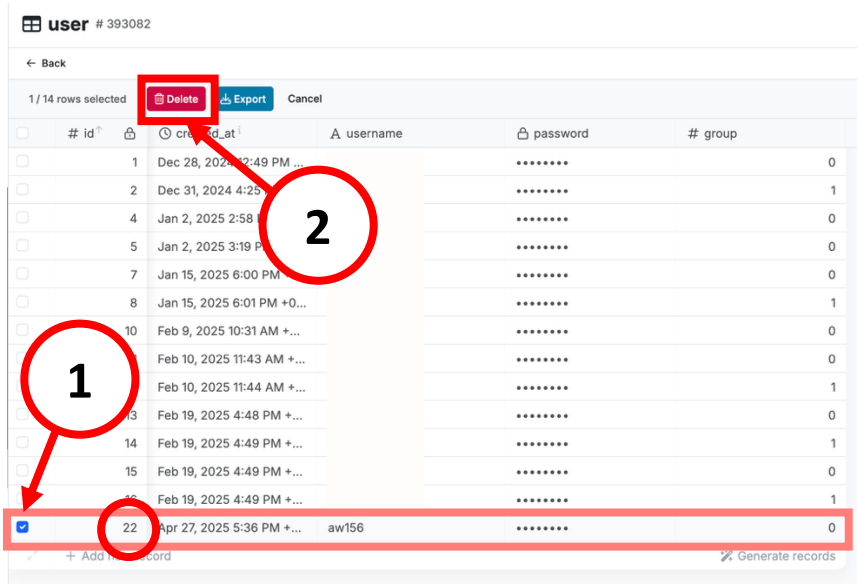

Figure A.81. Deleting a user in the 'user' table

14. **Done!** You have successfully deleted the exercise data entries, messages and username of this patient.