TABLE OF CONTENT

[1 WEBSITE DESIGN 2](#_Toc374707064)

[2 GRAPH REPORT 3](#_Toc374707065)

[3 TABLE REPORT 5](#_Toc374707066)

[4 Settings 7](#_Toc374707067)

[5 Sleep formula 8](#_Toc374707068)

[5.1.1 Sleep introduction 8](#_Toc374707069)

[5.1.2 Parameters 8](#_Toc374707070)

[5.1.3 Model 8](#_Toc374707071)

[5.1.4 Diagnosis 8](#_Toc374707072)

[5.1.5 Help/Info 9](#_Toc374707073)

# WEBSITE DESIGN



#### Feature 07: Sleep Monitoring

On the Track My Health home page, the user can select the

Sleep Monitoring feature icon. This will direct them to the

Sleep Monitoring page.

On the Sleep Monitoring page, the system will display a Graph button and a Table button, below the Sleep Monitoring sub-header.

# GRAPH REPORT

If the user selects the Graph button, then they will be able to see a Sleep Monitoring graph with an x-axis and a y-axis.

**KIỂU XEM BÌNH THƯỜNG (DEFAULT)**

**TRỤC X:**

The x-axis will reflect the date/time parameters of the data recordings,

**TRỤC Y:**

while the y-axis will show **several color-coded variables**; such as

|  |  |
| --- | --- |
| **sleep duration(orange)** | sleep duration and deep sleep duration will be measured in hours |
| **deep sleep duration (blue)** | sleep duration and deep sleep duration will be measured in hours |
| **number of time the user woke up (purple),** | The number of times the user wakes up will be reflected by the actual numbers |
| **sleep quality (green).** | Sleep quality will be measured using a scale from 1 to 10 |

**It is important to note that each sleep variable will be measured differently**

**Each variable will be tracked and reflected in the graph according to their particular color and measurement parameters.**

***Xem mục 4***

***Please refer to the formula document for further details on any parameters, or measures, listed in this section.***

**CHỌN KIỂU XEM THEO TIME INTERVAL PARAMETERS:**

The user will be able to select the desired time interval parameters via a **drop down box above the graph**.

If the user clicks on the drop down box, they will be able to change the time parameter to

|  |  |
| --- | --- |
| **daily** | for daily tracking, the system will display just one bar that reflects the raw data parameters and associated colors |
| **weekly** | for weekly/monthly tracking, the graph will show two bars that represent the mean (left bar) and the standard deviation (right bar) for the data parameters and associated colors. |
| **monthly** | for weekly/monthly tracking, the graph will show two bars that represent the mean (left bar) and the standard deviation (right bar) for the data parameters and associated colors. |

which will be displayed below the graph.

**START AND END TABS:**

To the right of the drop down, the user can choose the desired start and end date/time via the start and end tabs.

**NộI DUNG GRAPH:**

Within the graph, the user will be able to see a **single bar**, **or clustered bars**, that reflect data over time **(Bar Graph/Cluster Bar Graph).**

However, if there is **no data to display**, then there will be a

**notification** that states

***"You have no data to graph."***

**KIỂU XEM RAW DATA**

To the right of the end tab, there will be a **Raw data button**.

If the user selects this, then they can view the graph information in raw data format.

**TRỤC Y:**

With the raw data format, the system will display several parameters on the y-axis; such as

|  |  |
| --- | --- |
| **HR** | light red line |
| **Skin temp** | yellow line |
| **GSR** | black line |
| **g-values**  **(i.e. X,**  **Y, and**  **Z variables),** | green line,  red line,  blue line |
| **Activity level** | dark blue line |

These lines will represent each parameter's data over time.

**TRỤC X:**

Under the graph, the user can select the Date/Time section to display a **pop-up calendar**.

This will allow the user to select a desired start and end date/time.

# TABLE REPORT

Aside from a graph, the user can select the Table format.

**KIỂU XEM BÌNH THƯỜNG (DEFAULT)**

**CHỌN TRACK MODE:**

Date/Time parameter, the user will be able to select the desired time interval parameters via a drop down box above the graph. If the user clicks on the **drop down box**, they will be able to change the time parameter to daily, weekly, or monthly.

The tracking time interval will be indicated by the **title of the table** (e.g. Monthly statistics)

|  |  |
| --- | --- |
| **Monthly** | weekly/monthly tracking, the system will display two columns per parameter to show the mean and standard deviation for each parameter |
| **Weekly** | weekly/monthly tracking, the system will display two columns per parameter to show the mean and standard deviation for each parameter |
| **Dayly** | With daily tracking, the table will display only one column per parameter to reflect the raw data. |

With the table format, the system will display several

columns to represent

|  |  |
| --- | --- |
| **Sleep duration** |  |
| **Deep sleep** |  |
| **Wake up number (Wake up #)** |  |
| **Sleep quality** |  |
|  |  |

there will be several entry fields to reflect the data collected over time for each category.

**THE START AND END TABS:**

the user can choose the desired start and end date/time via **the start and end tabs**.

**KIỂU XEM RAW DATA**

As with the graph, the user can choose to view the table in Raw data format.

With the **Raw data Sleep Monitoring table**,

the system will display a number of

**columns** that represent

|  |  |
| --- | --- |
| **Date/Time** | For the Date/Time field, the user can select Date/Time and a pop-up calendar will display for the user to select the desired start and end date/time. |
| **HR** |  |
| **skin temperature** |  |
| **GSR** |  |
| **g-values**  **(X,**  **Y, and**  **Z variables)** |  |
| **Activity level.** |  |

Under each table header (i.e. Date/Time, HR, etc.), there will be several entry fields to reflect the data collected over time for each category.

**PHẦN DIAGNOSIS:**

Below the graph/table section, the system will display a Diagnosis and Recommendations field.

Initially, the Diagnosis and Recommendations section will have a

notification that reads

"This page displays your current medical issues and the date that they were noted in your medical record. Click on the issue name for more in-depth information on that particular issue."

By following the notification directions, the user will be able to retrieve details about their current diagnosis and previous diagnoses.

It will also detail recommendations based on the diagnoses provided.

**BUTTONS**

Beneath Diagnosis and Recommendations, there will be a

**Settings button** and a **Back to Track My Health button**.

If the user selects the Settings button, they will be directed to the Sleep Monitoring Settings page.

However, if the user selects the Back to Track My Health button, then they will be transferred to the Track My Health home page.

# Settings

On the Sleep Monitoring Settings page, the system will display a

**notification**, under the Sleep Monitoring Settings sub-header, that states

***"This page displays the current settings of this feature."***

Below the notification, the user will see **settings categories** that the user can change; For each category, the user can choose the desired settings.

|  |  |
| --- | --- |
| **Heart rate sample rate** | For example, the user can select a ten millisecond interval for Heart rate sample rate |
| **GSR sample rate** |  |
| **Accelerometer sample rate** |  |
| **Skin temperature sample rate** |  |

***Xem phần 4.***

***Please refer to the formula document for further details on any parameters, or measures, listed in this section.***

The user can also select the appropriate GSR sample rate, Accelerometer sample rate, and Skin temperature sample rate. Each category will have different settings that the user can select from to effectively track their Sleep Monitoring data.

Below the above settings,

the user has the option to **modify** the

|  |  |
| --- | --- |
| **Alarm setting** | to **Auto or Manual**. |

|  |  |
| --- | --- |
| **Auto** | sleep duration parameter  For example, the user can set it to 8 hours |
| **Manual** | The user can do this by selecting a desired Weekday and Time via clicking on the respective fields.  Add button> more file: weekday + Time |

**BUTTONS:**

Below the Sleep Monitoring settings, the user will see

Edit, Cancel, Save, and Back buttons.

If the user chooses to edit their settings, they will need to select the Edit button and make the desired changes.

Once the changes are made, the user will select the Save button so that the desired settings are saved.

However, if the user wants to cancel any changes, then they will select the Cancel button and no changes will be saved.

The user can also select the Back button. This will take them back to the Sleep Monitoring page.

# Sleep formula

### Sleep introduction

Our application uses activity-aware, multi-modal system that combines accelerometer, resting HR, skin temperature, and Galvanic Skin Response (GSR) information to detect sleep/wake up status and evaluate the sleep quality.

#### Accelerometer

#### Resting HR

#### GSR

#### Skin temperature

### Parameters

Wake up times

Sleep duration

Deep sleep duration

Sleep quality

### Model

TBD

### Diagnosis

Health risks related tosleep duration.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Health risks** | **Gender** | **Sleep duration** | | | | | | |
| 2-4 | ≤5 | 6 | 7 | 8 | 9+ | ≥10 |
| **Diabetes**  Relative risks (95% CIs) | Women  [Ayas03a]  Table 2 |  | 1.37 (1.07–1.77) | 1.13 (0.96–1.34) | 1.00 (0.86–1.18) | 1.00\* | 1.36 (1.04–1.73) |  |
| Men  [Yaggi06]  Table 4 |  | 1.95 (0.95–4.01) | 1.95 (1.06–3.58) | 1.00\* | 1.41 (0.78–2.55) | 3.12 (1.53–6.37) |  |
| **Coronary heart disease**  Relative risks (95% CIs) | Women  [Ayas03b]  Table 2 |  | 1.39 (1.05–1.84) | 1.18 (0.98–1.43) | 1.10 (0.92–1.31) | 1.00\* | 1.37 (1.02–1.85) |  |
| **Obesity**  Odds Ratios(95% CIs) | Women  [Gangwisch05]  Table 3 | 2.34 (1.24-4.41) | 1.93 (1.23-3.03) | 1.25 (0.93-1.68) | 1.00\* | 1.39 (1.08-1.80) | 0.84 (0.49-1.46) | 1.06 (0.43-2.57) |
| Men  [Gangwisch05]  Table 3 | 2.51 (0.83-7.53) | 1.07 (0.58-1.97) | 1.24 (0.84-1.82) | 1.00\* | 0.78 (0.51-1.17) | 1.93 (0.85-4.36) | 1.06 (0.33-3.39) |
| **Hypertension** |  |  |  |  |  |  |  |  |
| **Metabolic syndrome** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

Health risks related to sleep quality (slow-wave sleep).

Health risks related to sleep disorder Obstructive sleep apnea (OSA). OSA is an oxidative stressdisorder.

### Help/Info

Information about Sleep features: refers above.

Information about Accelerometer: refers above.

Information about Resting: refers above.

Information about GSR: refers above.

Information about Skin temperature: refers above.