The Use of Personalized Health Reports in a Student-Run Free Clinic

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Abstract

My Health Report (MHR) is a computer program that prints out personalized health reports for patients based on their basic health data and laboratory test results. Reports are available in four languages. The goal of MHR is to improve health communication and education. This program has been used by medical students in a student-run free clinic in Madison Heights, Michigan, since 2011 and supports students' efforts in providing patient-centered communication and education materials to an underserved population across multiple languages. Given its simplicity and portability, MHR may add value to student-run clinics elsewhere.

Introduction

There are many free clinics throughout the Detroit Metropolitan Area, Michigan, that provide medical care to underserved populations, including immigrants. Madison Heights is a suburb of Detroit with a large immigrant population. As of 2018, 18.3% of its residents were foreign-born.[1] The largest non-White populations are Black or African American (8.4%), Asian (5.4%), and Hispanic or Latino (2.4%). There is a need for high-quality, patient-centered communication and education materials, especially for non-English speaking poulations.[2] My Health Report (MHR) was created to address this need.

My Health Report

MHR is an innovative computer program designed to be used in clinical practice settings to enhance patient communication and education. The software allows for manual input of lab values such as blood glucose, blood pressure, cholesterol levels, and body mass index (BMI). MHR lab values are scored based on a four-star rating system calibrated against normal and abnormal ranges defined by the United States Preventative Services Task Force (USPSTF).[3] It then generates an individualized report for each patient's lab profile complete with feedback on lab values and relevant information on how to improve their health. MHR reports are currently available in English, Spanish, Mandarin, and Arabic. It is available for download on a website run by Open Source Medicine.

Foundational Work

My Health Report was originally programmed by Dr. Sean Mutchnick in 2011 when he was a medical student at Wayne State University. It was constructed using Visual Basic with Structured Query Language as a Microsoft Access application (Microsoft, Redmond, Washington). A colleague of his, now Dr. David Smeenge, improved upon the initial application and wrote the version of the program that is still used today.

Prior to the implementation of this program, many patients would leave clinical visit with a small sheet of paper containing hand-written numbers representing various measured health metrics. Dr. Mutchnick and Dr. Smeenge both observed that health fairs and free clinics had little to no health education material despite providing longitudinal care for many patients. They felt this program answered the need for both providing educational content and engaging patients

while also serving as a basic electronic record for longitudinal storage of health data. Patients were able to have a physical copy of their reports to refer back to with student doctors and even discuss with their primary care physicians.

In addition to a lack of health education material, the founders recognized a language barrier at certain clinics. To address this issue, they added a feature that translated the health reports into different languages. The translations for these reports were all performed and reviewed by native Spanish, Mandarin, and Arabic speakers.

Program Features

The interface used to input patient data is shown in Figure 1. Users enter information including low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, total cholesterol, triglycerides, fasting blood glucose, blood pressure, BMI, smoking status, and preferred language. Sample reports in English for BMI and smoking inputs are shown in Figures 2a and 2b, respectively. The patient is shown a star-value system that depicts how far from the standard range their results are (the more stars, the closer to the standard range). For example, if a patient had a blood pressure of 145/85, they would receive two out of five stars, and the printout would provide appropriate dietary suggestions and recommendations to recheck their blood pressure and visit a doctor.

Each section of the report is dedicated to a different lab value and discusses why the test is important in assessing their health, what their specific numbers mean, and lifestyle changes to improve them. The last page of the report highlights important points to review with a primary care physician, including questions about medications, a potential new diagnosis, and other implicated medical tests. It also provides both questions that patients should be asking themselves to test for comprehension as well as websites endorsed by the United States Centers for Disease Control and Prevention for more information.

Use at a Student-Run Free Clinic

In 2011, the Asian Pacific American Medical Student Association (APAMSA) at Wayne State University partnered with MHR for a monthly

Figure 1. My Health Report: Data Input Interface

free clinic held at a Chinese Community Center in Madison Heights. This clinic provides free health screenings to the local population, and patients are referred to their primary care physicians for any further medical interventions or major health concerns.

The zip code of this clinic has a population that is comprised of 5.4% Asian residents.[1] Most of the patients who attend the clinic are of Chinese descent. This monthly clinic is run almost entirely by first- through third-year medical students with a supervising physician. Students become involved through a volunteer program at Wayne State University School of Medicine.

The layout of the clinic is shown in Figure 3. MHR is in the last area that patients go to. As patients make their way through the different health stations, they approach the MHR table

Figure 2a. Sample Report

MY HEALTH REPORT

10/20/2014

Understanding your health report.
This report is designed for you to take control of your health.

Your health report includes:

- Values for determining your health
- Explanation of these values
- Why these values are important
- What you can do to improve your health
- Where you can get more information
- *My Questions*, a page containing common questions you can ask your doctor and yourself

My Health Report is a product of

Open Source Medicine

OSM

www.OSMSO.org

The recommended ranges provided are set by:

and are in no way endorsed or approved by Open Source Medicine or any of its associates. These values are typical, but you may have seen or heard of other values. This is due to a physician's personal goals set for his or her patients.

Your report overview.

	Rating	Current	Low Risk	High Risk
Blood Pressure (mmHg)	☆☆☆☆ No Data	0/0	120/80	140/anything
Glucose, Fasting (mg/dL)	☆☆☆☆ No Data	0	110 or lower	126 or higher
Total Cholesterol (mg/dL)	☆☆☆☆ No Data	0	200 or lower	240 or higher
LDL Cholesterol (md/dL)	☆☆☆☆ No Data	0		
HDL Cholesterol (md/dL)	☆☆☆☆ No Data	0		
Triglycerides (md/dL)	☆☆☆☆ No Data	0	150 or lower	500 or higher
Weight/Body Mass Index	★★★★ Excellent	24	18.6-24.9	30 or higher
Smoking (packs per day)	★★★★ Excellent	0	none	1 or more
Pulse Oximetry (%)	☆☆☆☆ No Data	0	99%	89%

This report is meant to be distributed in a responsible manner after review with a Physician or health extender, such as a Nurse Practitioner or Physician Assistant. The content of this report is general information and not medical advice; the content is not meant to be a substitute for professional medical advice.

Body Mass Index ★★★

➕ What is Body Mass Index?
Body Mass Index, or BMI, is a number that predicts how much body fat you have. It uses your height and weight.

➕ Why is Body Mass Index important?
Being overweight or obese can lead to health problems, such as:

- **Cancer**: some types of cancer, like breast or colon cancer
- **Diabetes**: type 2 diabetes is when your body can't control your blood sugar levels. See the module on glucose for more information.
- **Stroke**: when blood flow to part of your brain stops and your brain is damaged.
- **Sleep apnea**: a sleep disorder where people have abnormal pauses or slow breathing. This prevents your body from getting enough oxygen.
- **Hypertension**: high blood pressure. See the blood pressure module for more information.

What do the numbers mean?

18.5 or lower
This is underweight. For a person your height, you should weigh more. You should talk to your doctor.

18.6 to 24.9
This is normal. For a person your height, you have a normal weight. This is healthy.

25 to 29.9
This is overweight. You should talk to your doctor. The box below has tips to help you lose weight.

30 and higher
This is obese. There are many health problems that you can avoid by losing weight. Talk to your doctor and look below for tips.

➕ Where can I get more information?

- To learn about healthy living visit http://www.cdc.gov/healthyweight/losing_weight/getting_started.html
- For recipes, visit http://www.cdc.gov/healthyweight/healthy_eating/index.html
- Talk to your doctor. Ask for more information about losing weight.

What can I do to lower my Body Mass Index?

To lose weight, you must use more calories than you eat. There are two ways to do this: eat healthier and exercise.

Eating healthy foods, such as:

- whole grains: oatmeal, whole-wheat rice, whole-wheat bread
- vegetables and fruits
- foods low in saturated fats, cholesterol

Avoid eating when you're not hungry. Avoid eating until your stomach hurts from being full. Try new recipes (see link on the left).

Exercise. Exercising 20-30 minutes a day will make a huge difference. You can exercise 20 minutes at one time. Or you can exercise 10 minutes in the morning and 10 minutes at night.

Here are some ideas:

- Take the stairs instead of the elevator
- Go for a walk after lunch with a friend
- Pick up weights
- Try yoga
- Bike along the Riverfront

Figure 2b. Sample Report (continued)

Smoking ★★★★

Why is smoking harmful?

Smoking causes all of the following:

- Addiction
- Cancer
- Heart disease
- Lung disease
- Shortened life

Smokers live as much as 13 years less than non-smokers.

Why is quitting good for you?

There are many benefits to quitting.

- You will be healthier
- You will have more energy
- You will have more money when you stop buying cigarettes/tobacco
- You will be improving the health of your family and friends

Second-hand smoke can be as harmful as smoking.

Options to help you quit smoking:

When you have decided to quit, there are many options to help you.

- Nicotine replacement (gums/patches)
- Counseling
- Medical therapies

Talk to your doctor about medical therapies. Your doctor can help you decide what is best for you.

Where can I get more information?

- Visit www.smokefree.gov for a step-by-step guide and more information.
- Call 1-800-QUITNOW
- Call 1-877-448-7848 to talk to the National Cancer Institute to talk to a counselor
- Talk to your doctor. Ask for more information about quitting.

What are some tips to help me quit smoking?

Quitting is possible. The decision is yours.

- Take the problems of smoking seriously.
- Read more on how to quit.
- Write a list of personal reasons to quit.
- Stay away from things that make you want to smoke.
- Talk to others about wanting to quit.

My Questions

What questions should I be asking my doctor?

We don't get to see our doctors for a long time. So when we do see them, we need to know exactly what to ask. Writing down your questions before your appointment can help. This is a list of questions people ask their doctors. We hope it helps you.

Questions about medications

- ☑ What is the name of the medicine?
- ☑ Can I take a generic?
- ☑ What is this medication for?
- ☑ How much should I take?
- ☑ When should I take it?
- ☑ How long do I need to take the medicine?
- ☑ What should I do if I forget to take my medicine?
- ☑ What should I do if I accidentally take more than the recommended dose?
- ☑ Do I need to avoid any food, drinks, or activities?
- ☑ Should I stop taking any of my other medicine or vitamins?
- ☑ Are there any side effects?

Questions about a new diagnosis

- ☑ What is my diagnosis?
- ☑ Will I need any more tests?
- ☑ What are my treatment options?
- ☑ How soon do I need to make a decision about treatment?
- ☑ How much does this treatment cost?
- ☑ Are there any side effects?
- ☑ What happens if I choose to not have treatment?
- ☑ What is the outlook for my future?
- ☑ Will I need special help at home?

Questions about a medical test

- ☑ What is this test for?
- ☑ How is this test done?
- ☑ How accurate is the test?
- ☑ Is this the only way to find out that information?
- ☑ What do I need to do to prepare for the test?
- ☑ When will I get the results?
- ☑ What will the results tell me?
- ☑ What is the next step after the test?

What questions should I be asking myself?

A doctor appointment can be overwhelming. There can be a lot of information at once. Here are some questions you can ask yourself to make sure you got the most out of your appointment.

- ☑ Do I understand my diagnosis?
- ☑ Did I tell my doctor about all the medicines I am taking?
- ☑ Do I understand why it is important to take my medicine?
- ☑ Do I understand how and when to take my medicine?
- ☑ Do I understand the side effects of my medicine?

Where can I get more information?

These questions come from the U.S. Agency for Healthcare Research and Quality. You can find more questions at their website here:

http://ahrq.gov/questions/

with a sheet of paper containing all their lab results. Student volunteers input the result values into MHR and review the reports. Many of the patients at the clinic do not speak fluent English, and the majority of MHR reports are printed in Mandarin. The implementation of MHR has facilitated language-concordant written communication of health information to these patients in the presence of a language barrier. Moreover, there are some volunteers who can converse fluently in Mandarin and answer any questions that patients may have.

Discussion

Since implementing MHR in the monthly free clinics hosted by APAMSA, more than 1,140 reports have been generated. It is estimated that over 70% of the reports were in Mandarin, helping to bridge the language gap between the medical student volunteers and the patients seen.

Throughout the Detroit community, there is an extensive network of health screening fairs and student-run free clinics that could implement MHR. Most clinics have their own electronic health records, so MHR can serve as a supplement to their respective programs. Detroit and its surrounding suburban neighborhoods have diverse populations, and many patients in these communities may benefit from the option of health education materials translated into their preferred language.

Limitations and Future Directions
The program was originally created as a standalone program; it does not require the internet but as a result does not synchronize records between different computers with the program installed. This limits the ability to perform retrospective data review for longitudinal patients. Transitioning the program online may improve organization of patients' health information and facilitate data reviews. In addition, implementing a survey to assess patients' overall satisfaction with and medical comprehension of MHR can provide goals for quality improvement.

Additional improvements to the MHR software over the next year are currently being explored. At this time, the reports are printed with values from each current visit. Adding a feature to allow patients to see their previous lab values and their progress over time can help motivate patients. In addition, the standard range of lab values were last calibrated against USPSTF values in 2011 and should be updated regularly to reflect the most current standards. Additional resources for education and sites where patients can obtain more information will also be added.

Conclusion

MHR responds to an observed need for improved, multilingual communication and health education materials for patients at student-run clinics. Its simplicity and portability make it viable for use in a number of different clinical settings.

Disclosures

The authors have no conflicts of interest to disclose.

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