



Measuring Young Adult Health Engagement

An Interactive Qualifying Project Report

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Abstract

There is a movement taking off calling for greater patient engagement to motivate patients to be more involved in their own healthcare prevention and treatment, in order to provide more effective medical care. Through this Interactive Qualifying Project, we aided in this effort and tested a new Health Engagement Model by creating and administering an online survey. The model consists of three areas: Cognitive Engagement, Behavioral Engagement, and Healthcare Engagement. We applied this model and designed a survey to measure the Health Engagement of young adults, age 18-25. Measurement items included diet, exercise, mental health, general health, and vaccinations. We also collected demographic information from each of the surveyed students.

Acknowledgements

We would like to thank our advisors, Professor Vance Wilson and Professor Soussan Djamasbi, without whom this project would not have been possible. Thank you for taking three individuals with little knowledge of what it takes to construct and administer a survey and guiding us through the process. Your experience and feedback throughout the project were instrumental in our efforts to complete this project.

Authorship

Mahmoud El-rifai, Georgi Kardzhaliyski, and Greg Viera equally contributed to the project. Herein, we present a breakdown of the contribution by each of the team members.

Mahmoud El-rifai

Mahmoud and Georgi switched off generating our weekly agendas. Mahmoud designed our pre-survey questionnaire, which was a valuable tool in identifying initial concepts that could be used to generate survey items. He aided in the development of survey items. Mahmoud entered and helped to analyze the results from our pilot-survey. He created the charts for our

pilot-survey and undergraduate campus-wide survey. He also actively contributed to the editing of the final paper.

Georgi Kardzhaliyski

Georgi scheduled and secured space for all of our meetings. He and Mahmoud switched off creating our weekly agendas. He helped us identify our constructs during our concept generation phase. During the construction of our pilot survey, he aided in the development of survey items. Georgi entered and analyzed the results of our pilot-survey and undergraduate campus-wide survey. He also helped to produce the poster we displayed at the HDI Innovation Showcase. Georgi and Greg worked together to communicate with advisors and other individuals on campus.

Greg Viera

Greg used his previous knowledge of health, exercise, and nutrition to help identify concepts related to Health Engagement. He worked to reduce our initial list of concepts into a measurable list of constructs. He helped to edit and construct survey items for the pilot and campus wide surveys. Georgi and Greg worked together to communicate to advisors and other individuals on campus. Greg secured the support of the Student Development and Counseling Center (SDCC) and Student Government Association (SGA) for our undergraduate campus-wide survey. Greg was the lead editor for our survey items and all drafts of the research paper.

Executive Summary

Problem Statement

While there has been a lot of research conducted to measure the healthcare engagement of adults and senior citizens, little academic work has been done to understand the Health Engagement of young adults. They seem to be a forgotten demographic in the area of healthcare. From roughly age 18-25 young adults are beginning their transition from children under the guidance and direction of their parents to autonomous adults. This time period is often riddled with increased mental stress and the opportunity to partake in and make unhealthy decisions on a daily basis. This poses many problems because many adults start to form the habits that will evolve into their lifestyle during the transitional years when they are considered young adults.

Project Objective

The aim of our project was to develop and test a survey tool that would measure the Health Engagement of young adults based on the Health Engagement model designed by Professors Vance Wilson and Soussan Djamasbi. The survey tool had to accurately and reliably provide measurements about the current level of a young adult's Health Engagement. The tool was required to be constructed, tested, refined, and tested again within a 14 week period. It also needed to be able to be administered to individuals online. Once individuals took the survey the data had to be collected and then entered into a program that would allow it to be analyzed to see if the tool had accurately measured the Health Engagement of young adults.

Methodology

In order to develop a survey tool that could measure the Health Engagement of young adults enrolled as students at Worcester Polytechnic Institute we had to follow specific steps. These steps included: concept development, which was broken down to concept generation,

measure development, and measure refinement, then construction and administration of a pilot survey, analysis of pilot-survey results, refinement of survey items, construction and administration of a campus wide survey, and then analysis of the campus-wide survey results.

We began our concept development stage by administering a pre-survey questionnaire. This questionnaire was intended to show us some of the basic terminology or concepts that people think of when they hear the term, Health Engagement. By seeing what other individuals thought about when they heard the term Health Engagement we were able to start to frame and understand the many facets that play into one's health. This then lead us directly into the generation of a list of concepts that we could potentially test to measure young adult Health Engagement.

Once we had an initial list of concepts generated, traditional card sorting methods were utilized to reduce this list. The list needed to be reduced because the survey could not contain an endless number of measurement items because a large survey would reduce the number of responses from students. The list also needed to be reduced because for each concept we would need to generate a measurement item for the three areas of Professors Vance Wilson and Soussan Djamasbi's Health Engagement model.

Once our list of concepts had been refined and reduced to a list of testable constructs we began to generate measurement items. We then created multiple measurement items to test the three Health Engagement model areas, cognitive engagement, behavioral engagement and healthcare behaviors, for each construct. These initial measurement items became our pilot survey.

The pilot survey was administered to students in an undergraduate course at WPI via proprietary web software. The results of this survey were analyzed and utilized to refine the list

of measurement items for the development of a campus-wide survey. After we reduced, refined, and created a few additional measurement items, we administered a campus-wide survey via proprietary web software. The results of this survey were analyzed.

Results

After administering the pre-survey questionnaire and partaking in a few brainstorming sessions, we generated a list of over eighty concepts. This list was then reduced to a list of seven constructs. Next, we generated a list of minimum of three measurement items to test each area of Professor Djasmasbi and Professor Wilson's Health Engagement model. These items became our pilot survey which consisted of ninety-four items. Twenty-six students completed this pilot survey. We analyzed their responses in order to reduce our list of measurement items for our campus-wide survey.

Afterwards, we reduced the initial list of ninety-four measurement items to forty-eight measurement items which became our campus-wide survey. We administered the survey to the entire WPI student body and one-hundred and seventy-six individuals completed the survey. The results of the campus-wide survey were then analyzed by observing the descriptive data. In the near future, additional statistical analyses of the data will be conducted by our advisors, Professors Wilson and Djasmasbi. They will utilize Factor Analysis and Structural Equation Modeling techniques in their analysis of our data.

Personal Impact Statements

Mahmoud El-rifai

The scientific impacts of this project are clear to all, but the personal ones are herein explained:

Our project is aimed at finding ways to measure young adult Health Engagement and to see the aspects that make them engaged in their health. To achieve this goal, we had to sift through the difficulties that young adults are facing to create healthy life style. During that stage, as a college student and young adult, I started to realize the importance of being healthy at this age, especially when I had to do research about diseases that are spreading around the world like heart diseases and diabetes. I found that the majority of the time, people could prevent these kinds of diseases by having good health in the early stages of their lives.

However, this wasn't the only turning point that our project caused for me. I was more surprised when we started putting measures together that detected whether young adult were healthy or not. The diet and exercise portions really stood out to me. I felt as though I was not being honest with myself. Here, I am advising others to be healthy and trying to help them to follow healthy life style, while I have yet to achieve it myself. So I decided to start having a real healthy life style by making gym time a priority in my daily schedule and being more attentive to my food intake.

Georgi Kardzhaliyski

This project helped me take a step back and rethink my daily healthcare choices. It gave me the opportunity to educate myself on topics related to my well-being and sparked my interest in living a healthier life style. Prior to this project, I was unaware of topics such as insurance coverage and preventative medicine. Moreover, I did not feel comfortable talking about subjects related to my health with others. I have known the benefits of staying healthy, but I have not been applying them after coming to study in the United States. Through this project, I found it engaging to talk about health topics with my teammates, work together on defining our own life style, and starting the discussion about the life style amongst students in WPI and any other university.

Together with the rest of the team members, we overwrought our brains to create measurements that evaluate the engagement of young adults and two survey tools. I was exposed to both the social impact of a project, which is an area of interest for me. I gained experience in both the qualitative and quantitative research methods. I applied the Card Sorting Method and went through the process of designing two survey tools, which required more efforts than I had expected. Because of the structure of the project, I had the opportunity to be creative and easily express my views.

This project provided a valuable learning curve both for my professional and personal growth. The process of refinement helped me understand the value of having the questions in the proper format for the accurate response type and data set. It provided me with an insight into the techniques for capturing measurable data and turning it into metrics. The experience from this project will allow me to continue with this knowledge and become better when designing consumer surveys for future ventures.

Greg Viera

I have always been interested in exercise and trying to motivate people to do more of it. I had helped run a martial arts studio during my years in high school and have become an avid weightlifter since entering college. In both of these endeavors, I found that it is often very difficult to keep people motivated and interested in exercise long enough for them to see any real results. So the chance to research young adult Health Engagement sparked my interest the first time I read the project description.

While I may not have been able to get direct answers about how to motivate young adults to be more active, I was able to start to understand the many different activities in one's life that play into obtaining optimum health. I began to see how insurance, exercise, having a proper diet, access to accurate medical information, mental health support, and how monitoring these activities can lead to a truly healthy life. Proper Health Engagement to me started to evolve into a lifestyle that had to be maintained on a daily basis in order for a person to truly see any real benefit. In my spare time, I began researching more about nutrition and its impacts on the human body. I started to realize that an hour or two in the gym three to five days a week was simply not enough to stay in good physical condition, if outside of those few hours I paid little attention to how my actions could affect my health.

In order to reach a high level of personal health, I realized that I had to make some lifestyle changes. I also started to realize how many insurance providers and companies were interested in creating programs to promote healthy lifestyles. These programs often offered incentives to the individuals who decided to participate. It was interesting to see companies willing to pay out significant sums to keep their employees healthy. When I started to think about the numbers, I realized how much money these companies would save if they didn't have

to pay for multiple trips to the doctors per year because of an employee's lack of a healthy lifestyle. This got me thinking about ways to create a program or product that would aid these companies in trying to reduce their medical insurance overhead costs. While I still have a long way to go and a lot to learn before I can create such a product, the simple fact that I was able to identify a gap and demand in the market was exciting to me.

Overall, this project helped to expand my knowledge base in regards to healthcare. It showed me an avenue for future research and a potential service based business idea. Now the one thing that seems to weighing on my mind is whether I will be able to stay motivated enough to continue the lifestyle changes this project has instilled in me and to continue pursuing the knowledge and expertise required for starting a business that could impact the general health of every American citizen.

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Chapter 1: Introduction

Health Engagement is a popular issue emerging in healthcare. However, to date no theoretical model has been developed to predict and explain factors that affect young people's motivation to engage in managing their own health. Studies of young adults primarily focus on health issues (e.g., diabetes, depression) or pathologies rather than engagement. Additionally, the majority of healthcare providers ask for patient compliance in their medical treatments rather than patient engagement. The compliance model demands patients to blindly follow a recommended plan of treatment or prevention while patient engagement encourages healthcare providers to work with and educate individuals so they may take better care of themselves. There are currently no existing measures that focus on Health Engagement for young adults, i.e., people between the ages of 18 to 25. In this paper, we will be focusing on the Health Engagement of young adults.

It is important to specifically consider young adults because they are a section of the populous with unique characteristics when it comes to healthcare. Many healthcare behaviors that are established by young adults can carry over to their adult lives. In this study, we further dichotomized young adults to include only young adults attending a university. It is also during this time that these young adults begin to take over their own healthcare, as opposed to when they were children and their parents took care of all scheduling and maintaining their medical appointments and health, respectively.

The transition from parental healthcare control to a young adult making their own healthcare decision is one of the numerous simultaneous transitions that young adults go through as they move from children under their parents' roof to autonomous adults. These simultaneous

transitions can often lead to increased stress, poor mental health, poor eating habits, and many other physical and mental health problems.

For this reason, our IQP team studied factors that can help students improve an important aspect of their adult life: being engaged in managing their health. Our work was grounded in Professor Wilson’s and Professor Djamasbi’s proposed Health Engagement model (see Figure 1), which can help identify factors that can foster a healthier community at Worcester Polytechnic Institute (WPI), other universities, and eventually to the young adult populous in general. This model posits that the cognitive engagement of an individual influences their healthcare behaviors both directly and through the development of behavioral engagement.

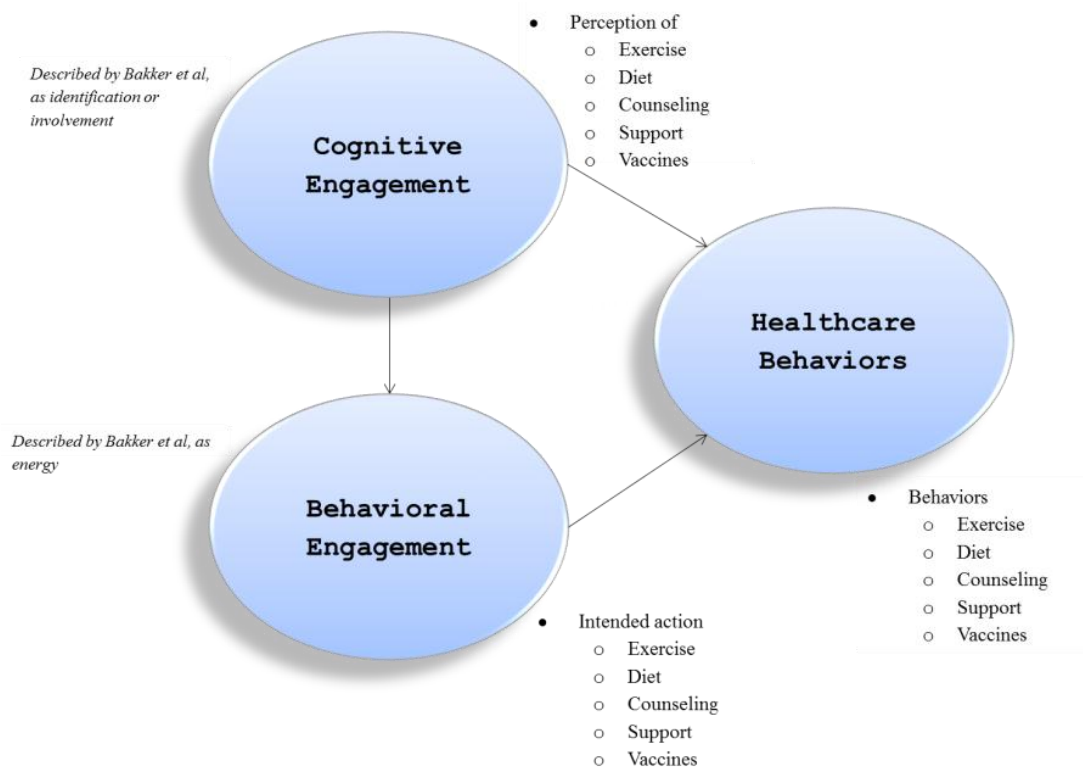


Figure 1: Health Engagement Model

As part of the project, the team familiarized themselves with instrument development techniques, developed constructs in qualitative research, learned to utilize traditional card sorting, and learned how to create and administer a survey measurement tool. Our objective was

to create and administer a campus-wide undergraduate survey and measure student perceptions regarding diet, exercise, mental health, general health, and vaccinations amongst the WPI undergraduate community. In order to do this we first needed to approach the WPI Institutional Review Board (IRB) Committee in order to obtain approval to administer our survey to the WPI student body. We also partnered with the WPI Student Development and Counseling Center (SDCC). We hoped to collect and measure about the Health Engagement of young adults attending university as undergraduates at WPI and through our efforts we gave students the opportunity to directly participate in addressing their healthcare concerns.

By improving the Health Engagement of young adults, we allow people to live healthier lives, give them a foundation of healthcare knowledge, and the ability to strive to improve their lives and mental well-being. Major supporters of these healthcare improvements include insurance companies. Insurance companies have been producing new programs to help lower their chance of having to pay out a claim, while simultaneously decreasing the financial obligation companies commit to insure their employees who are on the program. If people become more engaged with their healthcare, they would go to the doctors less often and the doctors could spend less time with each patient. Therefore, this project provides the potential for streamlining appointments and allowing a doctor to be more efficient, while providing more comprehensive care to patients who are properly engaged in their healthcare. There is a lot of research still to be conducted in this area to ensure advances are made in Health Engagement, but this IQP helps to build the foundational research of young adult Health Engagement.

Chapter 2: Background & Literature Review

Herein, we present our findings on six main topics. These include a definition of Health Engagement, demographic research on Health Engagement, Health Engagement initiatives provided by employers through health insurance companies, patient Health Engagement, and Health Engagement and mental health. This section concludes with the Health Engagement model mentioned in the introduction.

2.1 What is Health Engagement?

Health Engagement is an approach to each individual's health and well-being. Health Engagement describes the stage where individuals can be actively engaged in their health, including knowing their own health status and making informed decisions to improve it.

2.2 Why study Health Engagement for young adults?

Many of the studies conducted to determine an individual's perception and activities related to Health Engagement have been geared toward adults and senior citizens. However, in studies of health and health-related lifestyle choices, young people have been an under-researched demographic.

Young adults seem to be a more difficult demographic to get responses from and they are often considered healthy simply because they are young. Consequently, few surveys about students' health have been submitted at universities and other higher education institutions. As a result, little is known about how healthy these individuals really are. However, we found through research that many surveys of students present a challenge for a number of reasons: students often have more than one address, their term-time addresses may be temporary, and they have many distractions, from academic pressure to social and sporting activities (Stewart-Brown,

2000). Due to the lack of data available for young adult Health Engagement, we have deemed it necessary to begin to study this topic more in-depth.

2.3 What are examples of Health Engagement initiatives?

Many health insurance companies have begun showing interest in the Health Engagement of their insurance subscribers. They are encouraging their customers to be healthy by providing them with financial incentives to be engaged in their health, which means the more money you save the more engaged you are from the health insurance industry's perspective. The health insurance industry measures Health Engagement with a perspective focused on money as Trisha Torrey said: "The first goal of any business is to make a profit; that's how it stays in business. This is a fairly easy concept when it comes to health insurance companies" (Torrey, 2012). This can lead to ineffective results when the customers are not financially responsible. When young adults' health insurance has been paid by their parents, they are not driven by the incentive to save money since they are not directly paying for the insurance. For these reasons, financial incentives are not an effective approach to increasing young adult Health Engagement.

Health insurance companies care about profit because many of them have a financial commitment to their shareholders. The companies wish to raise revenue while trying to prevent their rate of claim pay out from simultaneously increasing. From a financial stand point it makes sense that they are likely encouraging young adults to obtain health insurance as early in their lives as possible. Insurance companies would prefer to eliminate the propaganda that portrays young adults as young and healthy, feeling invincible and invulnerable to the world around them. These typical feelings of youth could lead to many young adults eliminating health insurance from their lives and viewing insurance as an unnecessary expense. However, if the motion to eliminate health insurance is decided upon by a young adult, it can leave them susceptible to

large financial debts if they require medical care. If a car accident or sudden life threatening illness befalls them, they could find themselves in dire straits, being suddenly responsible to pay thousands of dollars in medical bills. These incurred bills could take years to completely pay off.

These debts could be extremely detrimental to a young adult trying to establish themselves as productive members of society. In fact, these medicals bills, incurred due to a lack of medical insurance, are a major contributor to people filing for personal bankruptcy (Jacoby, 2000).

On the other hand, employers look at Health Engagement from the perspective of saving money by paying less for their employees' health insurance "With healthcare costs rising an average 18.1% each year nationally, employers in every industry across the country are taking a long, hard look at what they can do to keep costs down" (Paul, n.d.). Companies also believe that by increasing their employees' Health Engagement, they are increasing each employee's productivity and ultimately making them more active and a more valuable asset to the company. Employers try to prevent illness by establishing disease prevention and health promotion programs. These intend to improve health and lower the cost of insuring employees (Harter, Schmidt, & Keyes, 2003).

A company's main objective with such programs is to decrease their annual healthcare claims costs, while building a healthier and more productive workforce. Having the employees engaged in their health and making measurable improvements reduce the annual healthcare claims cost for the employer and for the insurance company. By having to pay out fewer claims the insurance company is able to increase revenue and potentially increase their profit. For a wellness program to truly make an impact on employees, the employer, and the insurance company, it must empower employees to take responsibility for their own health-related

behaviors, engage employees to make sustainable and permanent lifestyle changes, and focus on the preventable conditions that often have the greatest impact on healthcare. These are important considerations young adults should consider as they make the transition from children under their parents' insurance to adults with their own plans.

2.4 What is Patient Health Engagement?

Patient Health Engagement is a special aspect of Health Engagement, because it does not measure individual actions, but rather it is an interaction between patients and clinicians (Center for Advancing Health, 2010). Patient engagement has been measured from different perspectives. The first aspect is measuring how patients see and think about their clinicians; the second is how they trust and rely on their clinicians guidelines. For healthcare professionals, patient engagement is the holy grail of healthcare. It allows them to spend less time with each patient while improving the care that the patient receives. It is a win for both the clinician and the patient. However, it is not easy to recognize an engaged patient, because being engaged is not just about blindly following or complying with the healthcare providers' recommendations, even though the healthcare team's recommendations might be exactly what is necessary for the patient to maintain or return to optimum health.

While the current healthcare engagement model is a compliance based model, it has been found that patients need to understand why the clinicians' recommendations are what they are, why they should listen to them, and how it will affect their lives if they do or do not perform the recommended action or actions. The clinicians' current compliance model is intended to place a high priority on achieving a high level of personal health, and for the patient to be very proactive in terms of achieving and maintaining above average health. The downside to this model is that it often induces a moderate to high distrust of the medical professionals (Wilkins, 2012).

Here is how Donna Cryer, CEO of CryerHealth, defines patient engagement:

“Properly done, patient engagement in action looks like shared responsibility between patients (and their families if applicable), healthcare practitioners (the entire team: surgeons, physicians, nurses) and healthcare administrators (providers of the infrastructure and payment models) to co-develop pathways to optimal individual, community and population health. Patient engagement brought to life means involving patients and caregivers in every step of the process, providing training or financial support if necessary to their participation” (Lamberts, 2013).

Achieving good measures for patient Health Engagement is accomplished by measuring two aspects of a patient’s care, which are counseling session attributes (objective) and cognitive involvement (subjective). A strong counseling relationship supports the patient’s confidence in treatment; that is, the patient comes to believe and understand that treatment can help change cognitions and behaviors that caused drug use problems and helps build the self-confidence necessary to change. As a consequence of developing rapport with and confidence in the clinician, patients make progress with behavioral changes and treatment goals (Joe, 1999).

2.5 What is the correlation between Health Engagement and mental health?

Many of the studies that are conducted on young adult healthcare focus on the mental health of young adults, but they do not provide information on treatment plans, future solutions nor do they provide suggestions about how patients could benefit from these things. Frequently studied mental health issues among young adults are depression and suicide (Djamasbi & Wilson, 2012). These mental health areas are of great concern because young adults in college are living in a transitional stage of their lives. Many students leave home for the first time to study for a degree and create a lifestyle free from parental influence and begin trudging the path of self-discovery. These factors often produce a great deal of stress and mental strain on a young adult

and can cause them to partake in detrimental behaviors or mental processes. The health-related habits that young adults can form during this period may be difficult to change later on in life.

During this time young adults are not yet out of their parents' supervision, which plays an important role in building a young adult's personality prior to college. They are dependent on their parent or parents for financial support and medical insurance. When parents control their children's lives by planning everything for them, and continue to do so when they enter the young adult stage by not letting their kids understand why they are following a unique life style and instead just demand compliance to their rules the young adult does not mature as much as they should. This can often be injurious to the young adult, even if the parents' rules are the correct and healthy lifestyle choices that the young adult should be making (Stewart-Brown, 2000).

Young adults often report feeling considerable pressure from their parents, from their peers, and from the new unsheltered world that they now live in. These pressures can often drive a young adult to engage in risky and often unhealthy behaviors. These pressures are even greater when young adults live in or around environments in which such unhealthy behaviors are considered normal. In these environments, the inexperienced young adult, free from the regulations of their parents, is in danger of adopting these unhealthy behaviors and potentially turning them into an unhealthy lifestyle.

2.6 What does the Health Engagement model present?

Previously many healthcare providers have focused on compliance based healthcare model instead of trying to actively engage patients in their own healthcare. Patient engagement depends on the interaction between patients and clinicians. In order for an individual to reach an optimum level of health many doctors are pushing patients to be engaged with their

own health. They are no longer just demanding that patients follow their directions and apply their prescriptions. Instead they are encouraging patients to learn why it is important for them to follow the directions and prescription that their clinicians' recommend, as well as learning preventative care measures.

This new approach allows individuals to be engaged in their own treatment and for it to become an important part of their lives. Research has revealed that engaged employees are highly energetic, self-efficacious individuals who exercise influence over events that affect their lives, due to their positive attitude and activity level (Bakker, Albrecht, & Leiter, 2011). Engaged employees see their tiredness as a pleasant state, because it is associated with positive accomplishments. Unlike workaholics, engaged employees do not work hard because of a strong and irresistible inner drive, but rather they work because they find their jobs to be fulfilling or fun (Bakker, Albrecht, & Leiter, 2011). These same concepts from worker engagement can be applied to Health Engagement.

Our study looked to apply the concepts from work engagement to the area of young adult Health Engagement. Living a healthy lifestyle is not an easy task for many young adults. Rather than forcing them to comply to the healthcare demands of their clinicians we hope to promote a healthy lifestyle, by showing them the importance of being healthy and helping them to learn that maintaining or reaching optimum health can be an enjoyable experience. In our study, we looked at three major perspectives that influence their decisions: Cognitive Engagement—the knowledge and the feelings that young adults have toward their health, Behavioral Engagement—the intentions and plans they have to improve their health, and Healthcare Behaviors—their current health status and the actions they take to improve, maintain, or negatively impact it (Wilson, Djasasbi Health Model, 2013 based on, Bakker, Albrecht, &

Leiter, 2011). This is based on the Health Engagement model developed by Professors Wilson and Djasasbi (see Figure 1) which was developed following the work of Bakker, Albrecht, and Leiter (2011).

Chapter 3: Methodology

In collaboration with Professors Wilson and Djamasbi, we defined our own methodology in order to complete this project consisting of multiple stages: concept generation, measurement development, measure refinement, pilot survey creation, pilot survey testing, reduction and refinement of the pilot survey, administer a campus-wide survey, and validation of the campus-wide survey.

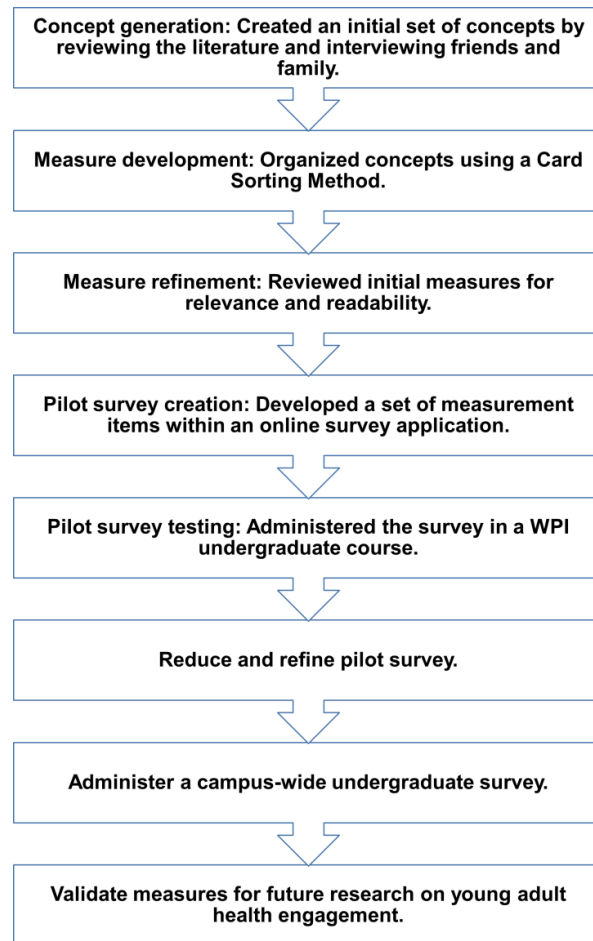


Figure 2: Methodology

3.1 Concept development

It was first necessary to develop a definition of Health Engagement to compose a survey intended to measure young adult Health Engagement. The IQP team approached the task of creating this definition by identifying potential concepts related to Health Engagement. We

administered a brief questionnaire to teenagers, young adults, and adults within and outside the WPI community. The survey consisted of one question, “What are the first three words that come to mind about Health Engagement?” In addition to this question, we collected basic demographic information, specifically their age, gender, and education level.

In the survey, we identified that when people initially think about the phrase Health Engagement, they tend to think about the following concepts: doctors’ appointments, diet, exercise. Participants also mentioned Obama-care, insurance, and hospitals. The IQP team disregarded the term Obama-care because we felt it did not add any value to creating a definition of Health Engagement. We used the broader term of health insurance in its place.

3.1.1 Concept generation

We then examined several pieces of literature related to Health Engagement for adults, the elderly, and young adults to identify additional concepts that could help define Health Engagement and aid us in generating questions for our survey tool. Through this analysis, we determined that Health Engagement is a broad term that incorporates many aspects from the life of young adults. We decided that Health Engagement relates to every facet of their life that may somehow have an effect on their health. Due to the broad nature of this realization, we began brainstorming and drafting a list of concepts that would represent the entire spectrum of concepts that fall within the term of Health Engagement.

Through examinations of literature and discussion with individuals within and outside the WPI community, we ended up generating a list with over 80 different, though often overlapping, concepts that we could then use to help us generate questions for our pilot-survey tool. In an effort to shorten this list we utilized traditional card sorting methods. After we completed the card sorting, we were left with a list of seven different concepts, which we then termed

constructs. The concepts areas were developed based on results of the directed survey and through reading literature on the topic and through personal experiences.

3.1.2 Measure development

We wrote all this down during the brainstorming sessions. We distinguished the overlapped topics, by using a traditional Card Sorting Method. Using this method, we minimized the list of concepts to include only constructs, or “mental abstractions that we used to express the ideas, people, organizations, events, and/or objects/things that we are interested in” (Constructs, n.d.). These constructs included health decisions, exercise, diet and nutrition, health concerns, daily activities, health education, and preventative medicine.

We kept in mind how many items the resulting survey must include in order to sufficiently test each of the constructs. It was a balancing effort between designing a survey that was short enough that young adults could respond to, given their tight schedules at our university, and a survey that encompassed enough questions to give an accurate measurement of how engaged young adults are with their health.

3.1.3 Measure refinement

We then began to formally define Health Engagement. We decided to define Health Engagement as the “actions individuals must take to obtain the greatest benefit from the healthcare services available” (Center for Advancing Health, 2010). We based the definition of Health Engagement on the Health Engagement model designed by Professor Vance Wilson and Professor Djamasbi (see Figure 1) and definitions of Health Engagement from additional sources. The Appendix section outlines a list of the references for this project.

Once we had a definition of healthcare engagement, we returned to our reduced list of constructs and began drafting survey items that could potentially measure our definition of

Health Engagement within the various constructs. The initial constructs included: health decisions, exercise, diet/nutrition, health concerns, daily activities, health education, and vaccinations.

3.2 Pilot-survey

We then began generating a list of items to be incorporated in our pilot-survey tool. The concepts we measured included: health decisions, exercise, diet/nutrition, health concerns, daily activities, health education, and vaccinations. We developed our list to include multiple questions for each concept and to measure participants' perceptions, their anticipated and current actions to stay healthy.

3.2.1 Pilot-survey creation and testing

Next, we proceeded to compose questions intended to measure the Cognitive Engagement, Behavioral Engagement, and Healthcare Behaviors of individuals. The questions we composed were reviewed by our team and advisors, edited, expanded upon, or removed as we deemed necessary.

At the end, we agreed to administer a list of ninety-four questions for our pilot-survey. We designed the pilot-survey to get sufficient data and interpret the healthcare model designed by Professor Wilson and Professor Djamasbi. By having this initial data, we could validate the potential for further research on the Health Engagement model. The pilot-survey was administered to the students in an undergraduate class via proprietary web software.

3.3 Campus-wide survey

After administering the pilot-survey, we determined that many of our topic areas were unnecessary and did not add value to determining a young adult's level of Health Engagement, which is what we were trying to test. We then refined our pilot-survey to a list of forty-eight

items, intended to measure the Cognitive Engagement, Behavioral Engagement, and Healthcare Behaviors of the surveyed. The topic areas included diet, exercise, healthcare, and mental health. These forty-eight items became our final-survey, which was administered campus-wide. We used the same proprietary web software for the final-survey.

Chapter 4: Results and Discussion

This project began with the realization that young adults are an often neglected research demographic when it comes to the topic of Health Engagement. We identified that many of the academic or private research concerning Health Engagement was directed toward adults or senior citizens. Particularly, we discovered that there is no successful tool in place that would accurately measure the Health Engagement of young adults. Therefore, the IQP team decided to fill this gap by creating a survey tool that can be used to accurately and reliably measure the Health Engagement of young adults.

4.1 Concept Development

As mentioned in the previous section, the team administered a brief survey to sixteen individuals to see what first came to mind when they heard the term Health Engagement. Out of these participants, eleven were male and five were female. Their age ranged from sixteen to forty-seven. The results from this survey revealed to us that when many people hear the term Health Engagement, there are several concepts that seem to surface more often than others. Particularly the concepts of diet, exercise, insurance, doctors, hospitals, and injuries, surfaced the most. These concepts gave us a rough framework of what Health Engagement might entail and gave us a starting point for further research.

4.2 Pilot-survey

The pilot-survey consisted of ninety-four questions intended to measure the seven concepts listed above. We utilized various question styles within these questions, including: binary, semantic differential, Likert scale, and open-ended memo questions. The survey was administered to twenty-nine students in an undergraduate course, though only twenty-six of them

completed it. The data was collected in the span of one week. The results of the survey were collected via proprietary web software.

4.2.1 Demographics

The data generated and collected during the pilot-survey was entered into Excel for statistical analysis. There were twenty-one male (80.76%) and five female (19.24%) students who took our pilot-survey. Their age ranged from nineteen to twenty-three. The results were based on the responses on eleven students at the age of twenty, seven at the age of twenty-one, three at the age of twenty-two, two at the age of nineteen, and one at the age of twenty-three.

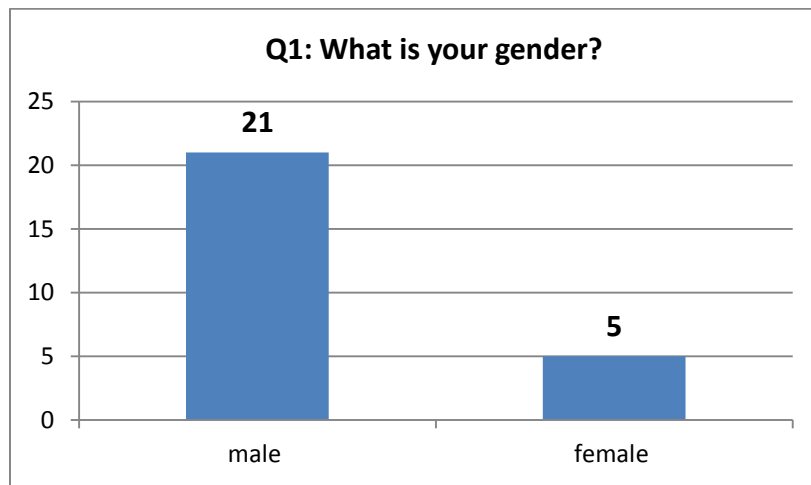


Figure 3: Pilot-Survey Demographics Gender

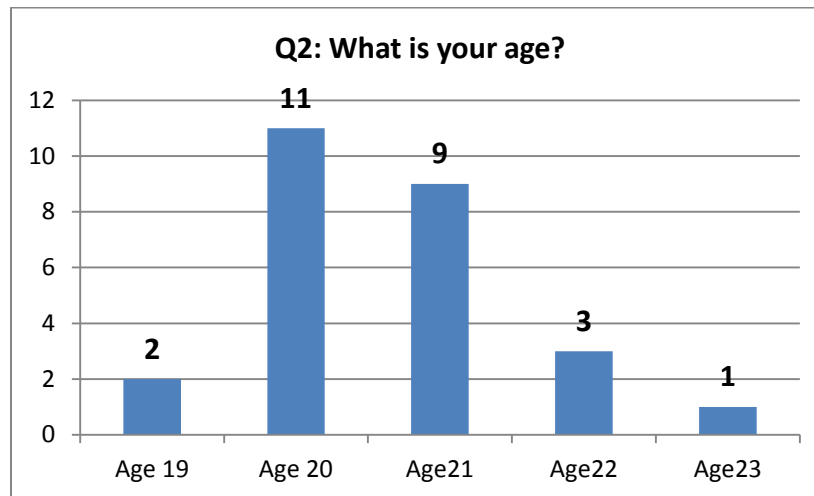


Figure 4: Pilot-Survey Demographics Age

4.2.2 Data Analysis

Below we detail the qualitative results of our pilot survey. The results of the qualitative results required us to manually identify any patterns within the responses. Our advisors Professor Wilson and Professor Djamasbi will be analyzing the quantitative data using at a later time

4.2.2.1 Qualitative Analysis

Our first question asked the surveyed to, “List all the team sports you have played during the past year.” Many of the answers were varsity football, soccer, basketball, volleyball, soccer, and lacrosse. Seven out the twenty-six participants had not played any team sports and answered this question was not applicable to them.

We also asked “How do you educate yourself on personal healthcare topics?” to help us find the means that student are using to educate themselves on health topics. Many of the responses mentioned web resources, such as WebMD and Google, some of the students said in severe or important situations they ask their primary physicians. Reading health magazines and newspapers were mentioned in their responses, as well as asking their parents for some health information or advices. Seven out of the 26 participants did not find this question applicable to them and answered with N/A.

We also asked them to, “List the aspects of your healthcare that are most engaging to you.” Many of the responses were going to the gym, exercising and staying in shape, dental and weight management. Seven of the participants answered this question was not applicable to them.

Lastly, we asked the surveyed to, “List any specific actions you plan to take to stay healthy during the current year.” Many of the answers were eating well and exercising, sleeping,

and walking. Two of the twenty-six participants who answered this question replied that it was not applicable to them.

4.2.2.2 Quantitative Analysis

Analysis of the student responses will be conducted by our advisors, Professor Wilson and Professor Djamasbi. The survey instrument was developed further base upon reliability analysis conducted by our advisors.

4.3 Phase 3: Campus-wide survey

We based our analysis on the responses of one hundred and seventy-six participants. The data was collected in the span of a week. Below we detail the analysis of the data from the responses.

4.3.1 Demographics

Herein, we present the demographic results of the survey. The survey was filled out by seventy-six male (43.18%) and one hundred female students (56.82%). Their age ranged from seventeen to twenty-seven. The results were based on the responses from forty-eight students at the age of twenty, forty-six at the age of twenty-one, twenty at the age of twenty-two, thirty-eight at the age of nineteen, and eighteen at the age of eighteen. There were two students at the age of twenty-seven and one student each at the age of seventeen, twenty-three, twenty-four, and twenty-five.

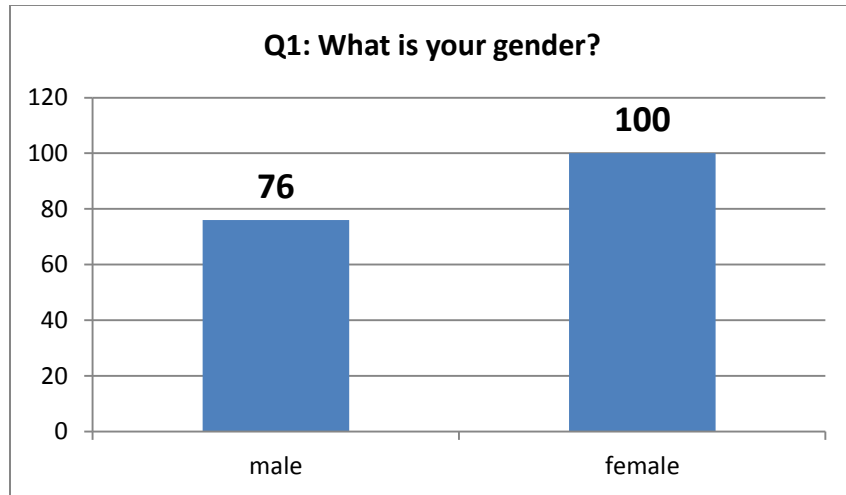


Figure 5: Campus-wide Demographics Gender

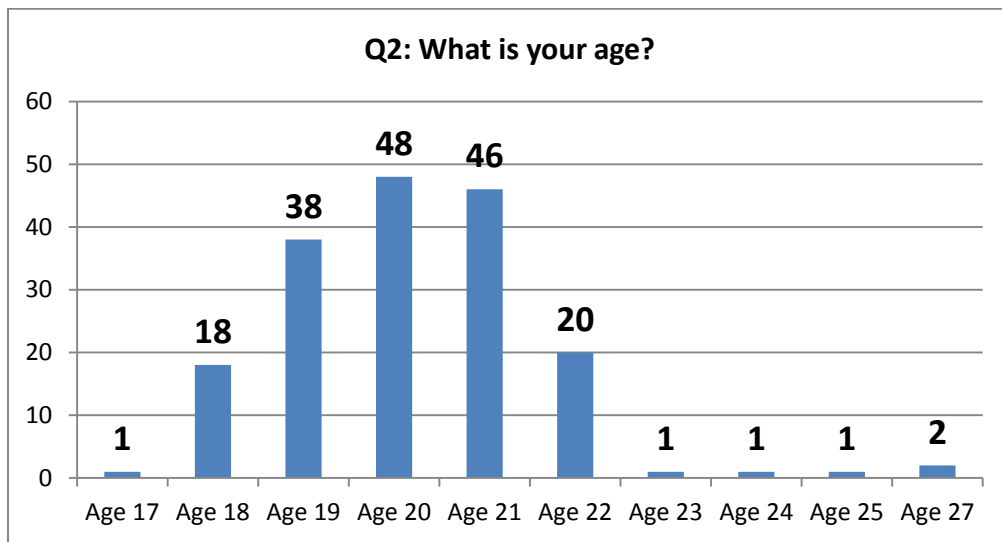


Figure 6: Campus-wide Demographics Age

In addition to the demographic questions from our pilot-survey, we collected information about the weight and height of the population. We used the responses from these questions to measure the Body Mass Index (BMI) per each student and the average for the surveyed population. The BMI “is a measure of body fat based on height and weight that applies to adult men and women”(Calculate Your BMI - Standard BMI Calculator, n.d.). Based on the data set, one hundred and three of the participants had normal weight, fifty-five were overweight, ten

were underweight, and eight were in the range of obesity. The average weight for the one hundred and seventy-six participants was 150.72 pounds.

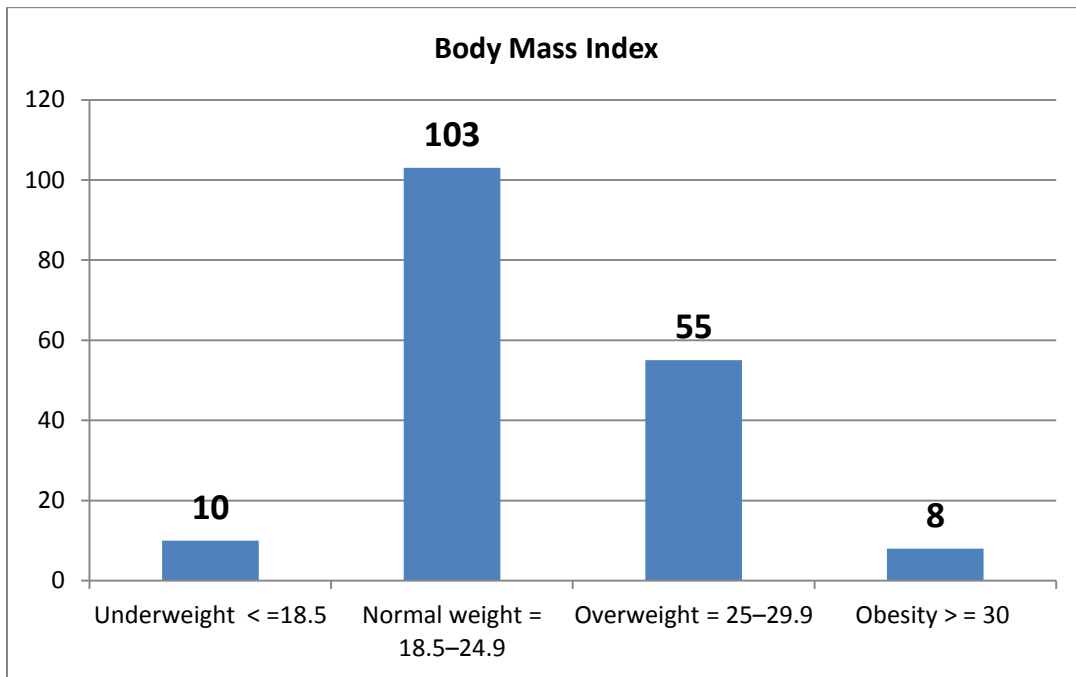


Figure 7: Body Mass Index (BMI) Measurement

4.3.2 Data Analysis

Our survey consisted of both qualitative and quantitative questions. Some measurement items were better suited to have a qualitative or quantitative response. The differences in the measurement items also allowed us to vary the kind of items asked to keep participants from simply blindly answering items. Herein, we separate our data analysis and outline the results from both research methods.

4.3.2.1 Qualitative Analysis

We asked a few qualitative questions on the campus-wide survey. One of the questions asked individuals if they played any team sport over the last year. We felt this was a relevant question to help measure health behaviors of individuals for the construct of exercise. The answers to the question varied significantly and it is hard to determine the level of exercise that

each individual did or didn't receive without asking how much time they spent partaking in their sport each week.

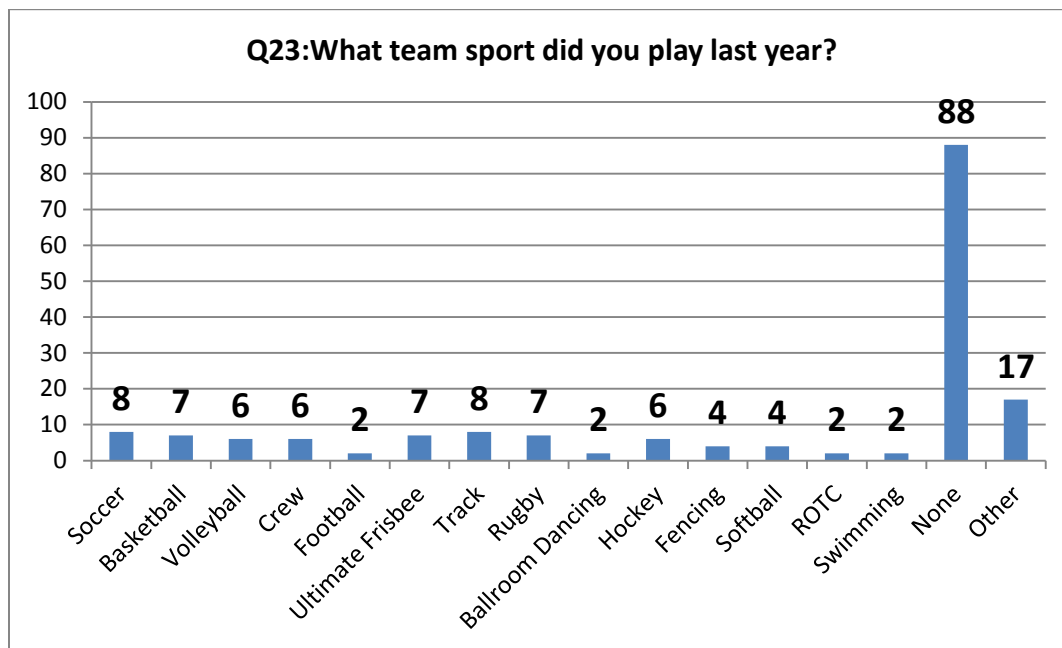


Figure 8: Campus-wide Team Sports

Another question that we asked was about general health of the surveyed participants. We asked them, “What aspects of your healthcare are most engaging to you?” and received a diverse range of responses. Many of the participants answered that the most important aspect for them was exercising and going to the gym, eating well, keeping a well-balanced nutritional diet, mental health, and managing their weight. There were also participants who were confused by this question and did not provide an answer. Other responses included having regular doctor check-ups and insurance coverage. A portion of the population answered that they did not find healthcare engaging and were not worried about their health.

We also asked about the intentions of the population to improve their health. We collected responses based on the question, “What specific actions are you planning to take in order to improve your health during the current year?” and received a range of responses. All in

all, many of the responses were about continuing to exercise regularly, taking PE classes to stay in shape, swimming, maintaining a nutritious diet, taking multivitamins, and sleeping. Other specific actions included avoiding drinking soda, eating junk food, drinking more water, eating more fruit and vegetables. There were participants who also mentioned going to the Student Development and Counseling Center to help them minimize the amount of stress and playing sports. On the hand, there were also students who had not thought about this question and did not have a plan.

Our last question asked the surveyed, “What specific actions are you planning to take in order to stay healthy during the current year?” and gather their responses in a free form. Similarly to the previous question, the participants replied they would continue going to the gym on a regular basis, will eat healthy, take PE classes, maintain a low-carbonated and gluten-free diet, and take part in sports activities. A number of the surveyed answered that they did not plan on taking any action for staying healthy. Others found this question the same as the previous one. In comparison to the previous responses, a few stood out. Some of the surveyed answered that they would start walking instead of using transportation, would cook their own food and bring lunch bags with them instead of eating at the food court, get vaccinations, and eat three meals daily. Continuing, other participants answered they would not eat snacks during the night, would drink more water, and eat three balanced meals. There were also responses about having more fruit and vegetables, only one plate at the dining hall, and filling 1/3 of the plate with fruit and vegetables.

4.3.2.2 Quantitative Analysis

Analysis of student responses will be conducted by our advisors, Professor Wilson and Professor Djamasbi. The survey instrument was developed further base upon reliability analysis conducted by our advisors.

Chapter 5: Conclusion and Recommendations

This chapter summarizes the results of our pilot and campus-wide survey and also provides suggestions for future efforts to build a tool to measure young adult Health Engagement. We intend for these suggestions to be a guideline for future work and are steps that we would have taken to improve our measurement tool if we had not been constrained by time.

5.1 Conclusions

From the first brainstorming session we held in order to generate concepts, it became clear that the term Health Engagement encompasses a large array of topics that pertain to health. For this reason it is applicable and almost necessary to think about Health Engagement not as simple actions that individuals can perform on an occasional basis, but rather as a lifestyle that should be upheld on a daily basis. In order to get individuals and especially young adults to accept and implement a healthy lifestyle is incredible difficult to do for many of the reasons that have been stated previously in this paper.

From our analysis of the qualitative measurement items we have determined that young adults on the WPI campus are becoming engaged in their own healthcare. In our pilot survey we asked, “how do you educate yourself on personal healthcare topics?” and the answered we received showed that the majority of young adults used web resources (e.g., WebMD, Google) or in extreme cases consulted their primary care physician. A few others said that they would read newspapers, magazines, or articles related to health and a few others said that they would consult their parents. We also asked young adults, “to list the aspects of their health engagement that was the most engaging to you.” The responses we received were that young adults found going to the gym, staying in shape, dental, and weight management to be the most engaging. Another question, “list any specific actions you plan to take to stay healthy during the current year.” The responses were, eating well and exercising, sleeping, and walking.

In our campus-wide survey we asked, “what aspects of your health care are most engaging to you?” The responses varied, but the majority answered one of the following, eating well, going to the gym, keeping a well-balanced diet, and managing their weight. A few others responded, having regular doctor check-ups and insurance coverage. Another question we asked on the campus wide survey was, “what specific actions are you planning to take in order to improve your health during the current year?” Responses included, continuing to exercise regularly, taking PE classes to stay in shape, avoiding drinking soda and eating junk food, taking multivitamins, and sleeping. There were also responses that mentioned going to the Student Development and Counseling Center (SDCC) to help minimize the amount of stress and others simply answered playing sports. There were also student who had not thought about improving their health in the current year and did not have any plans to do so. The final qualitative question we asked on the final survey was, “what specific action are you planning to take in order to stay healthy during the current year?” Responses to this question included, continue going to the gym on a regular basis, eat healthy, take PE classes, maintain a low carbonated and gluten-free diet, and take part in sports activities. A number of the participants in the survey responded that they did not intend to take any actions during the current year that would help them to stay healthy. Some other individuals responded that they would start walking instead of taking transportation, that they would pack their own lunch instead of eating at the campus food court, get vaccinations, some said they would eat more fruits and vegetables, and eat three meals per day.

5.2 Recommendations

It is difficult to make concrete recommendations for future work based on the survey measurement tool we designed because we did not have all of the data analysis complete at the time this statement was written. However, we do recommend the following for future work in

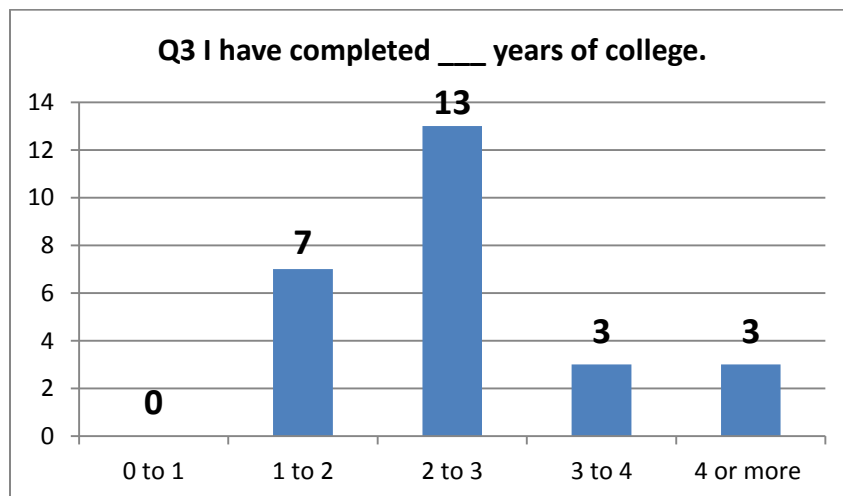
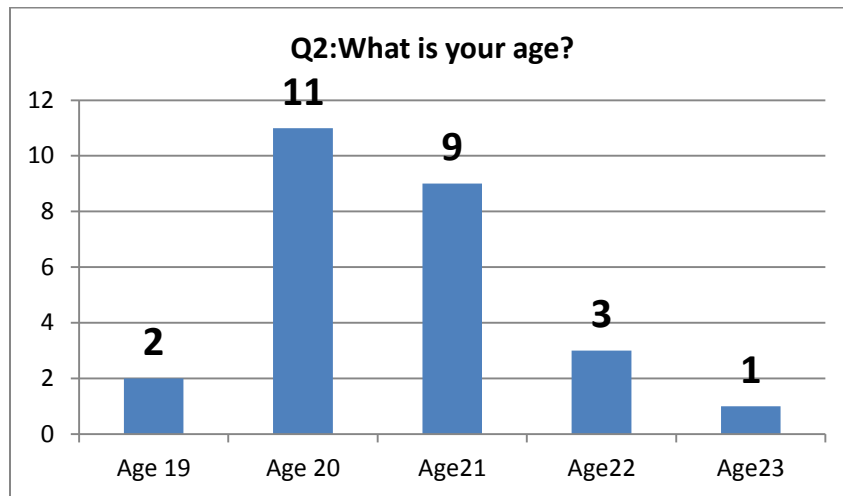
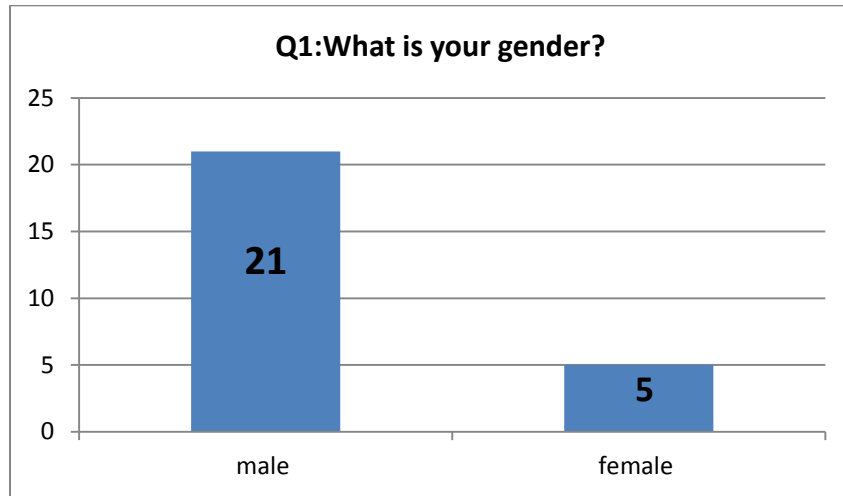
creating a tool to measure young adult health engagement. We recommend that any future project groups take time to completely list and consider all aspects of a young adults' life that could impact their physical or mental health. In short any future project, intended to measure the health engagement of young adults, should take a holistic approach to the topic to produce an accurate and reliable measurement tool. Also, we recommend that future work in this area does not hesitate to ask difficult or more detailed and particular questions as measurement items. The participants of the survey seem to know the basics of being engaged in their health, but they do not always take action based on their knowledge. It could be beneficial to test the depth of the survey participants' knowledge. This could be done by making measurement items that have drastically varying degrees of difficulty.

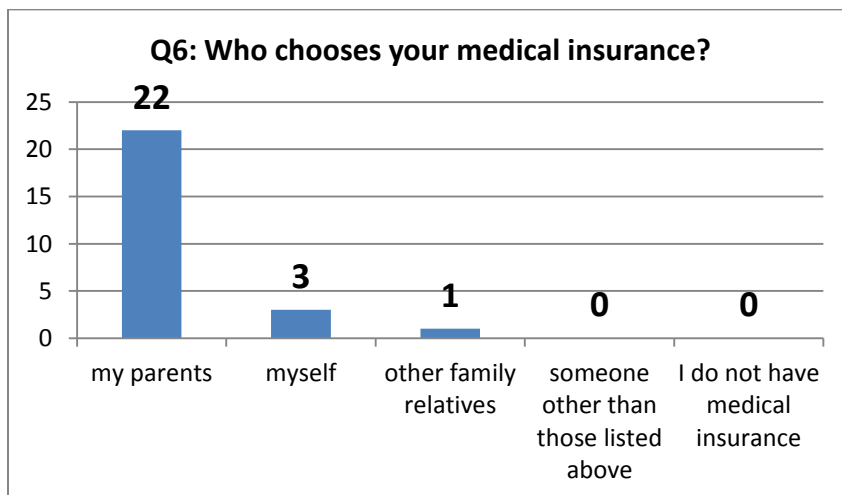
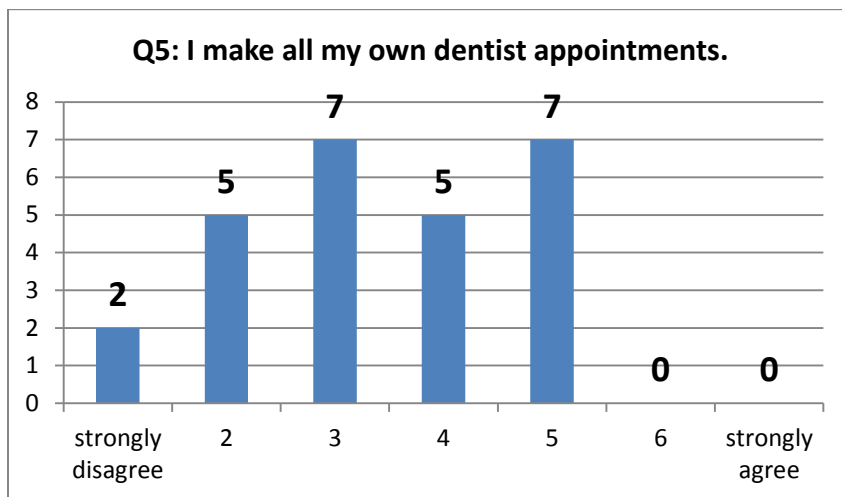
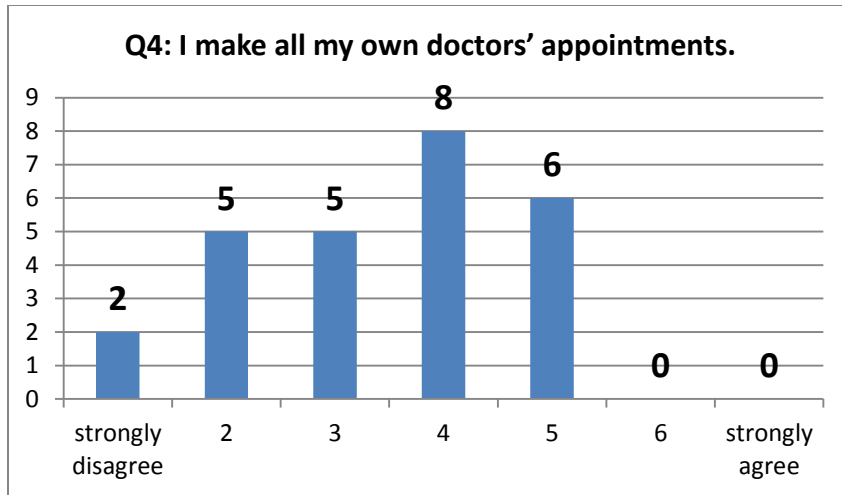
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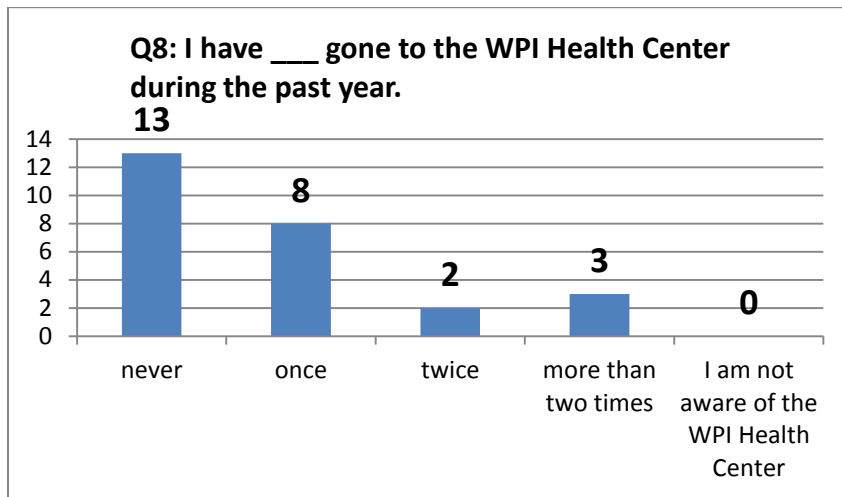
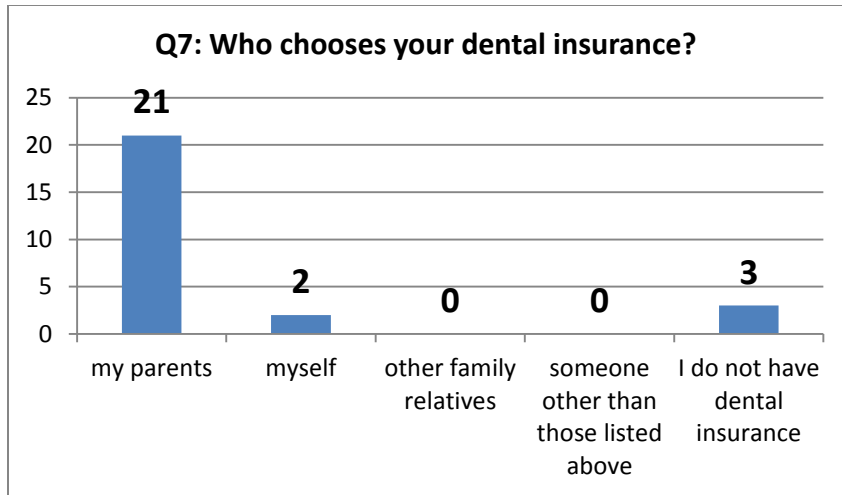
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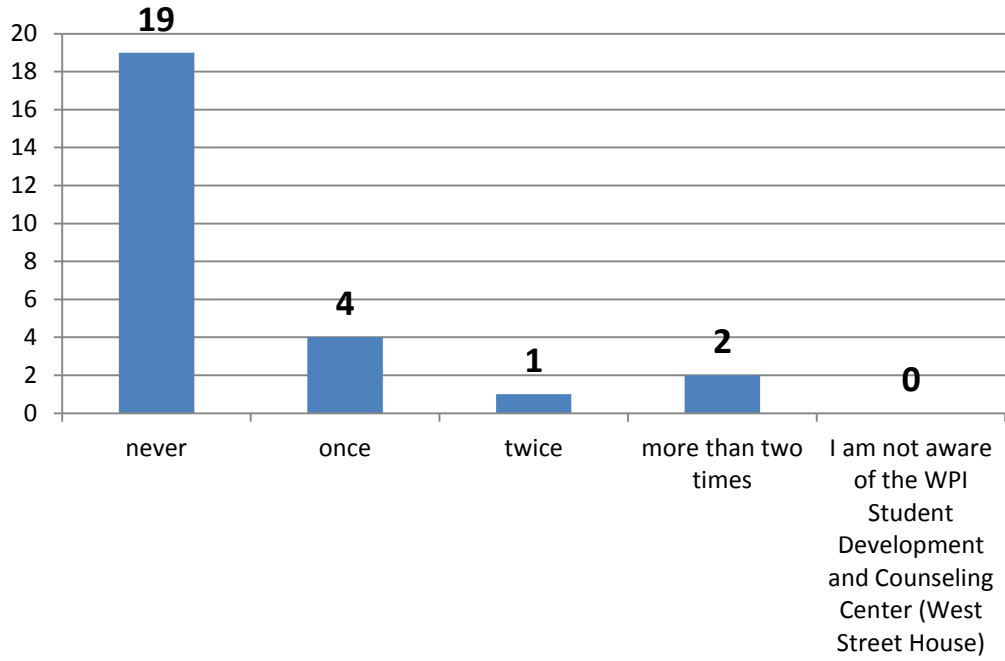
Appendix A: Pilot-survey Results



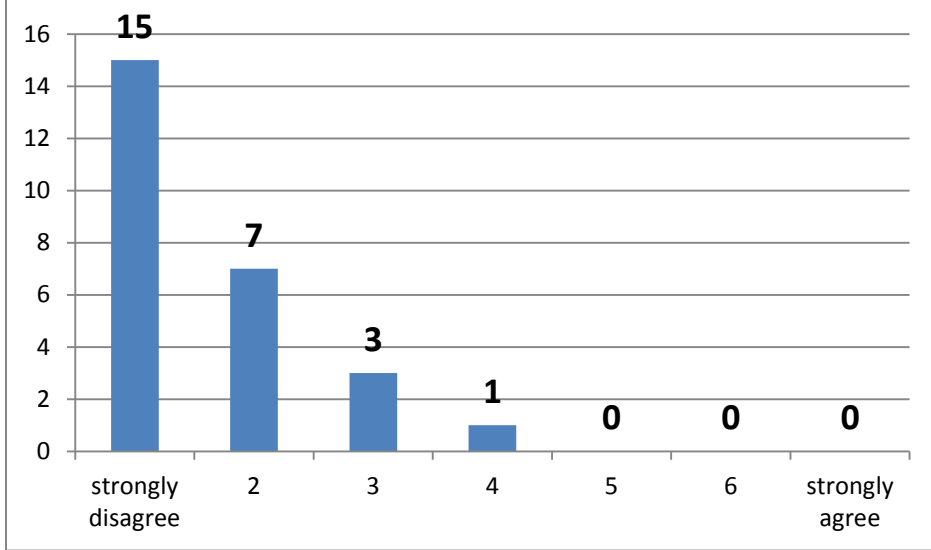




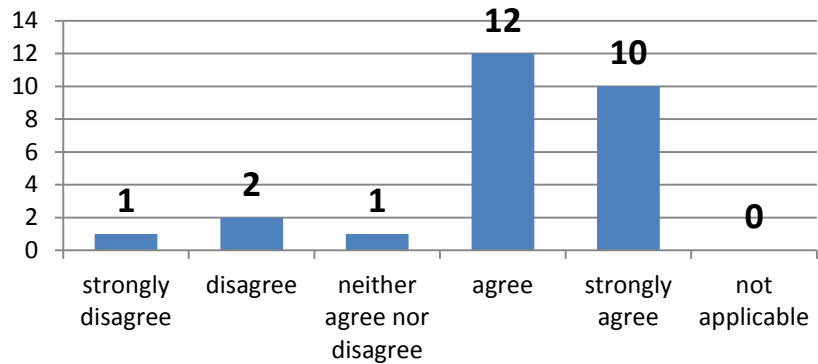
Q9: I have ___ gone to the WPI Student Development and Counseling Center (West Street House) during the past year.



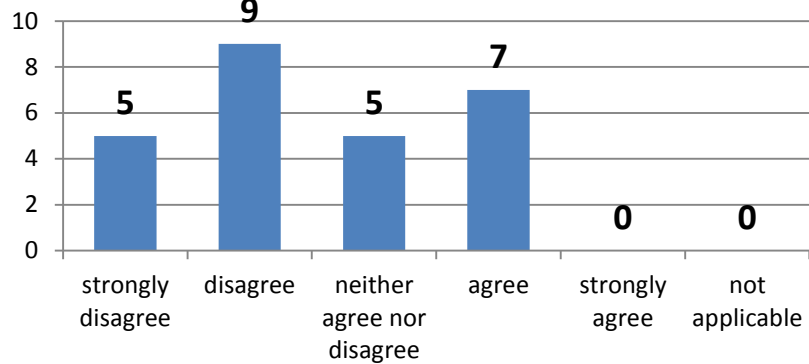
Q10: I am aware of the location of major hospitals in the Worcester area.



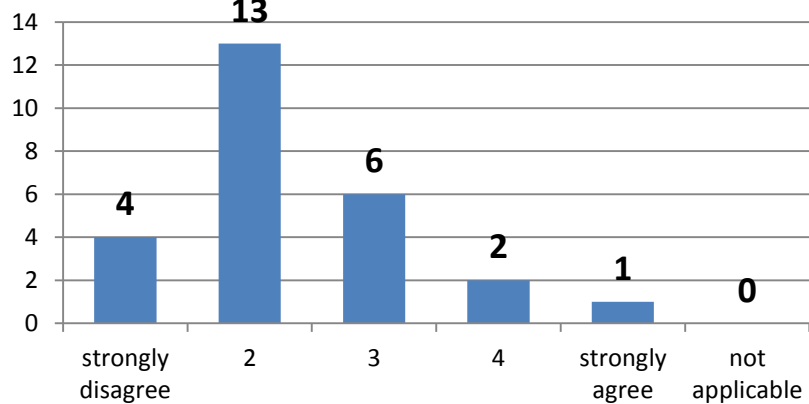
Q11: I regularly go to my scheduled medical appointments.

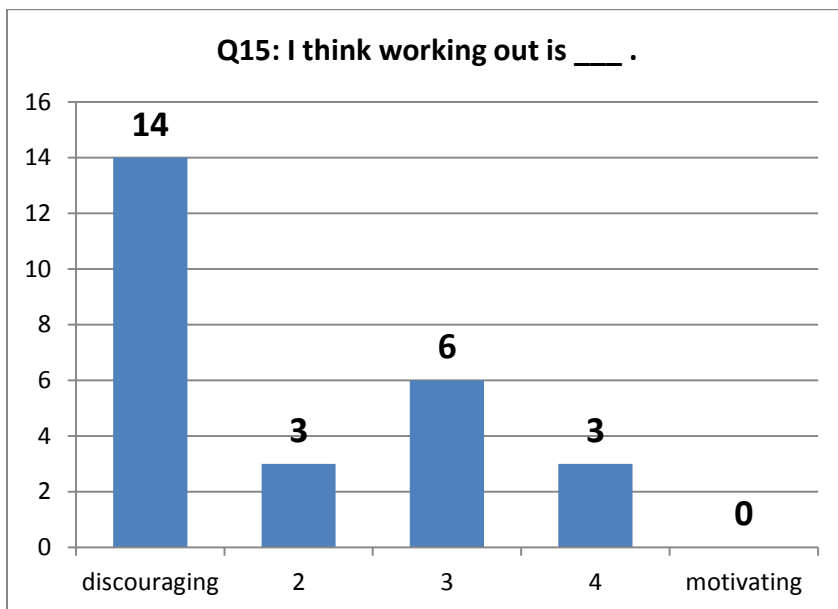
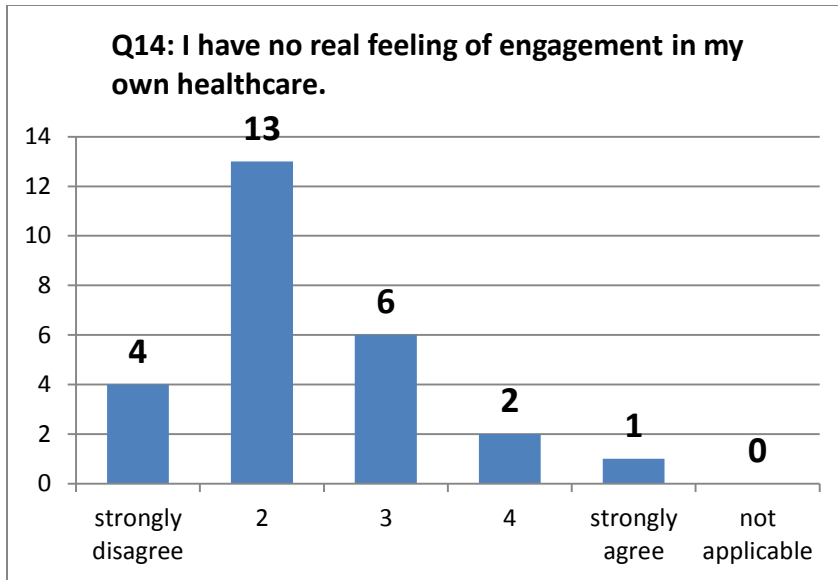


Q12: I regularly go to my scheduled dental appointments.



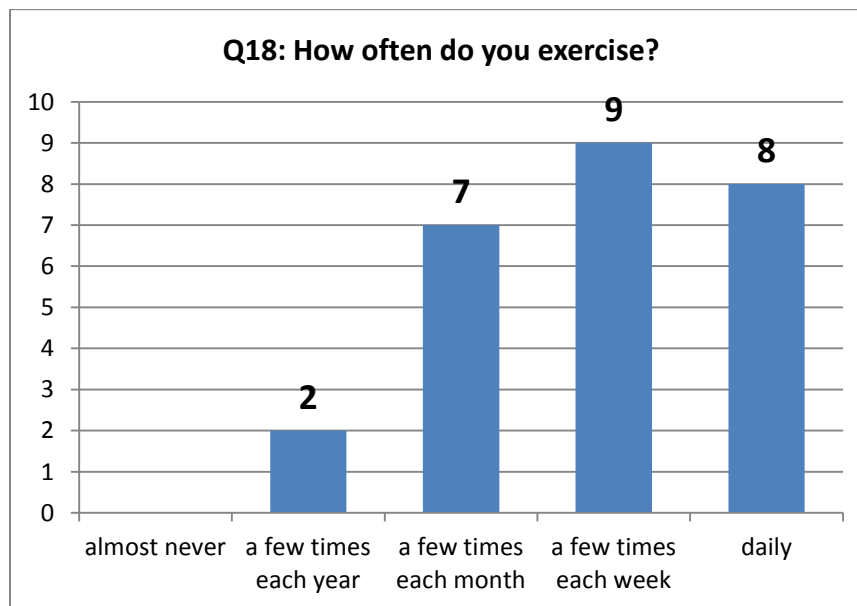
Q13: I feel I am engaged in my own healthcare.

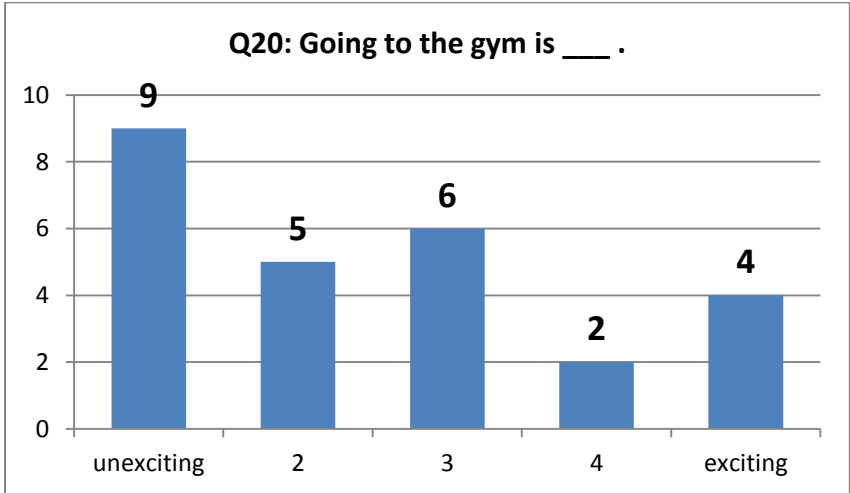
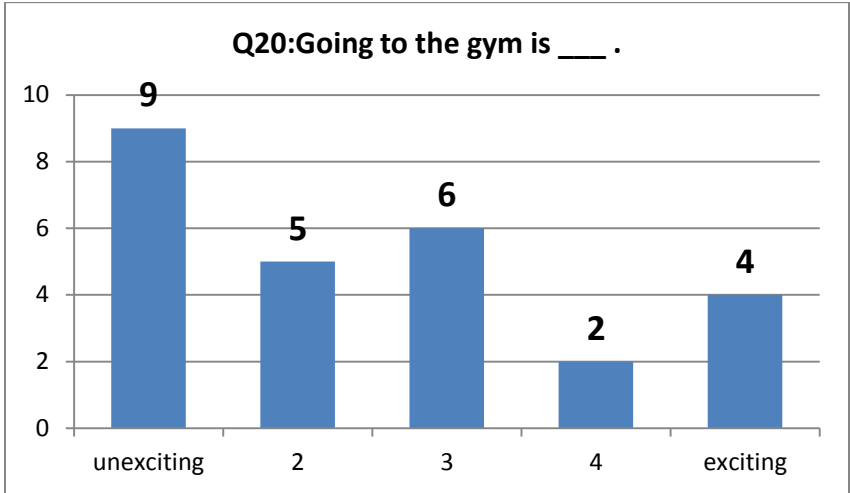
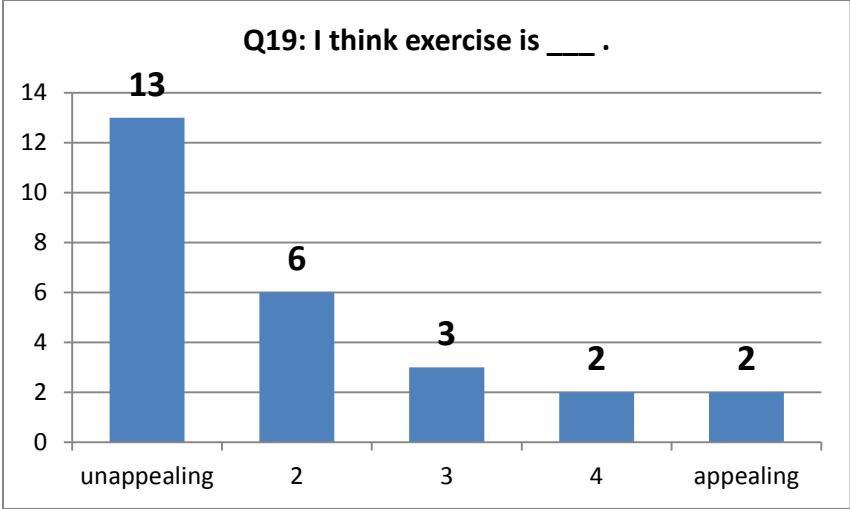


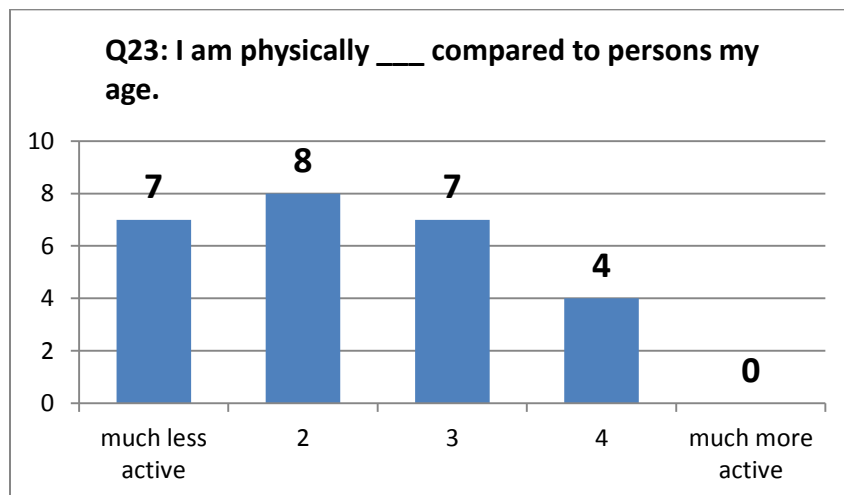
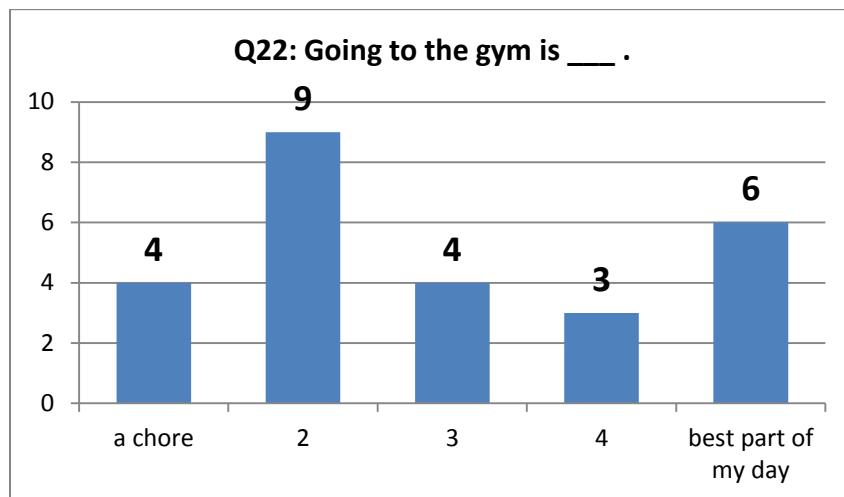
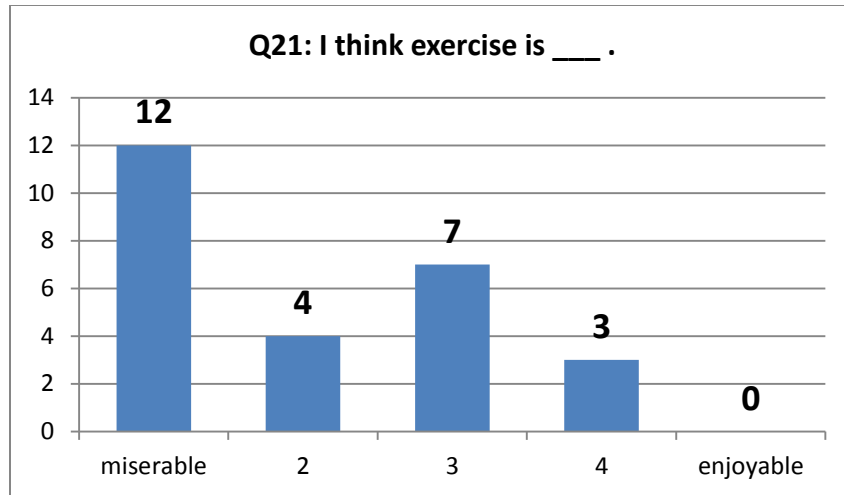


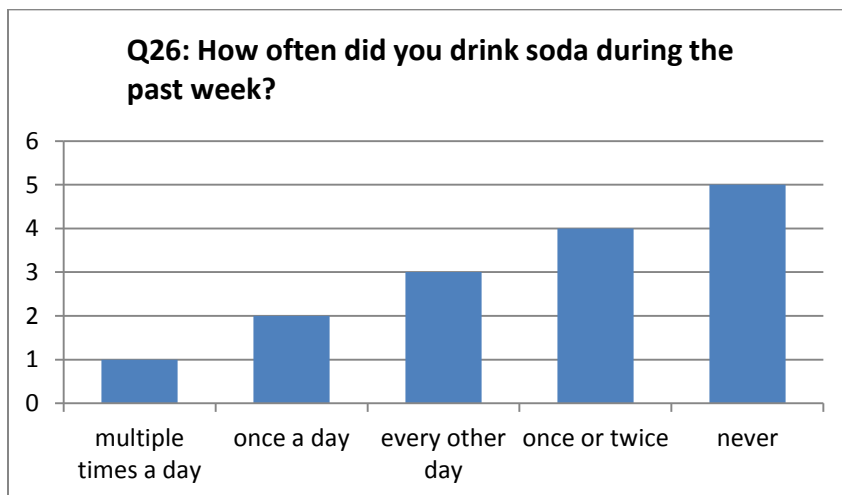
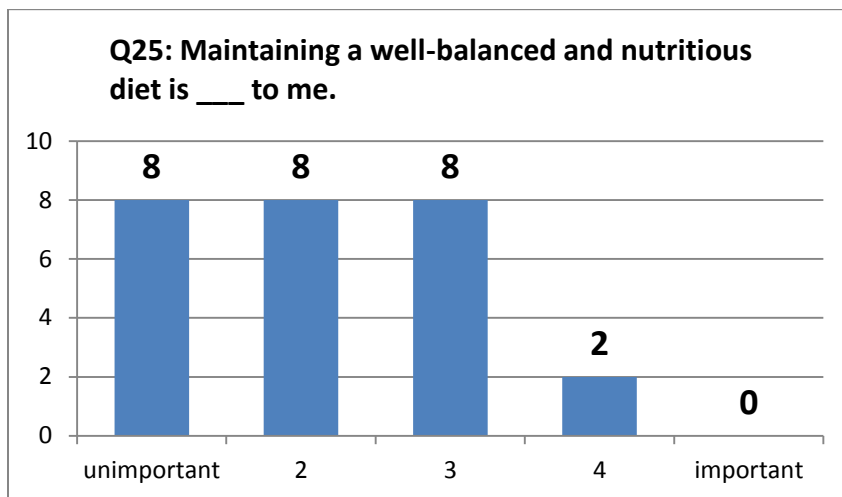
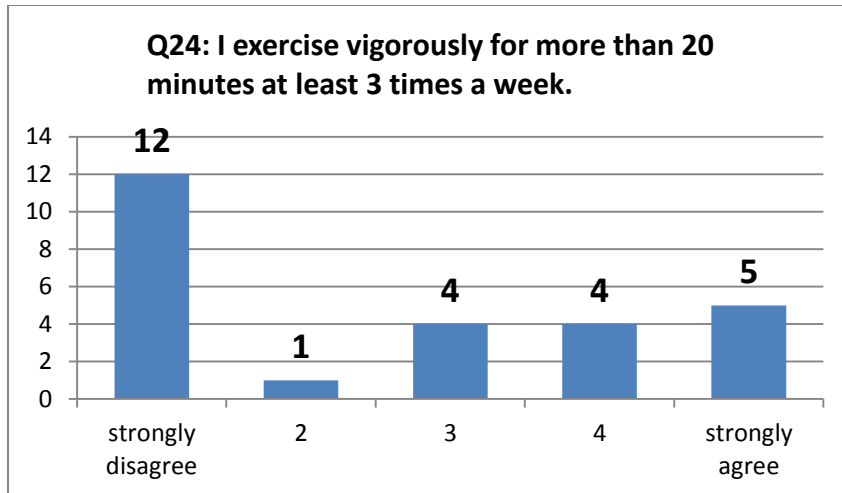


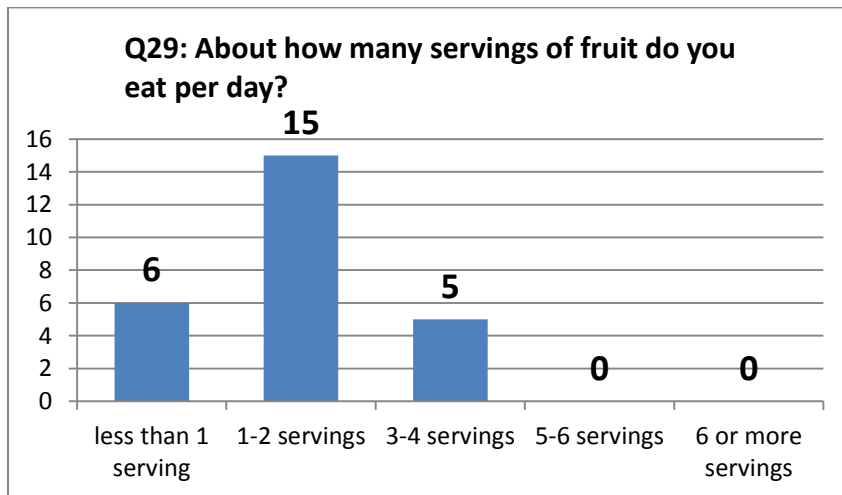
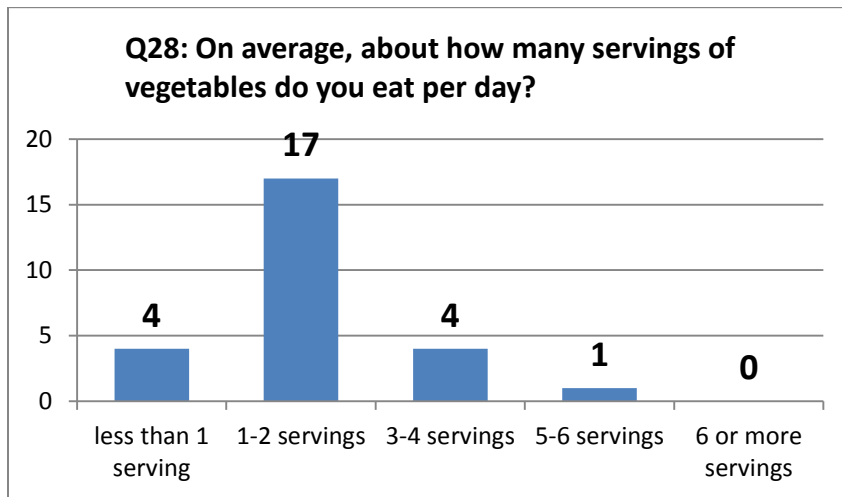
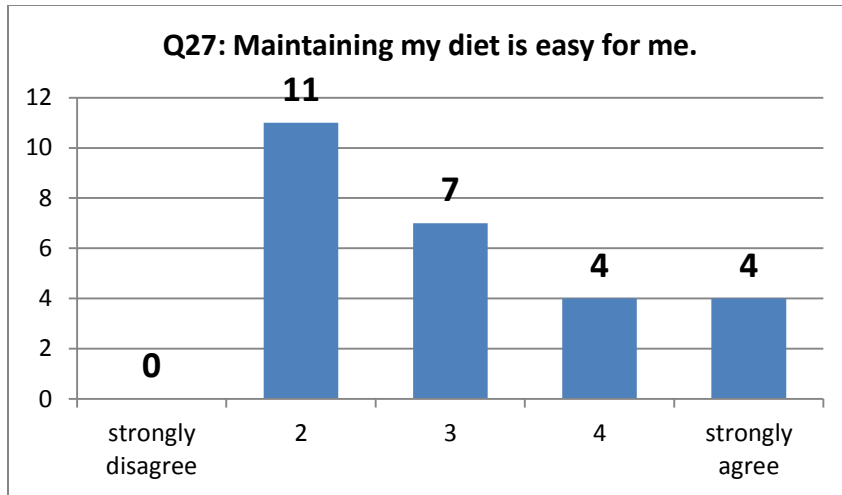
Q17: List all the team sports you have played during the past year.

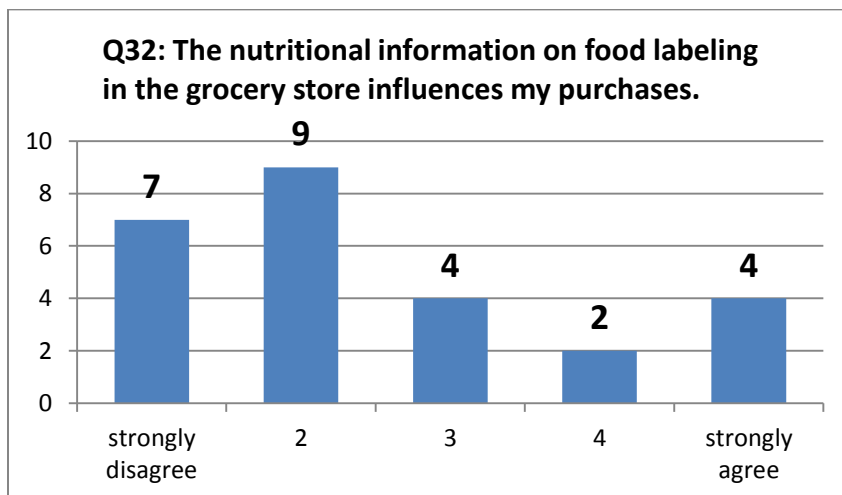
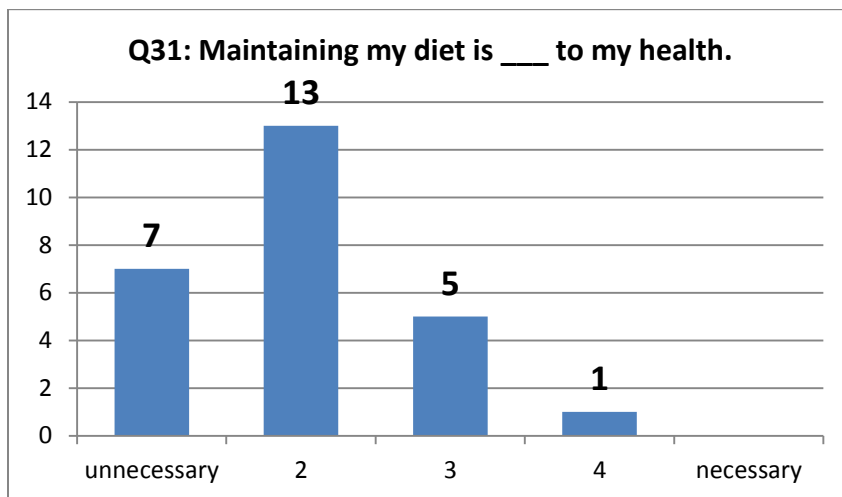
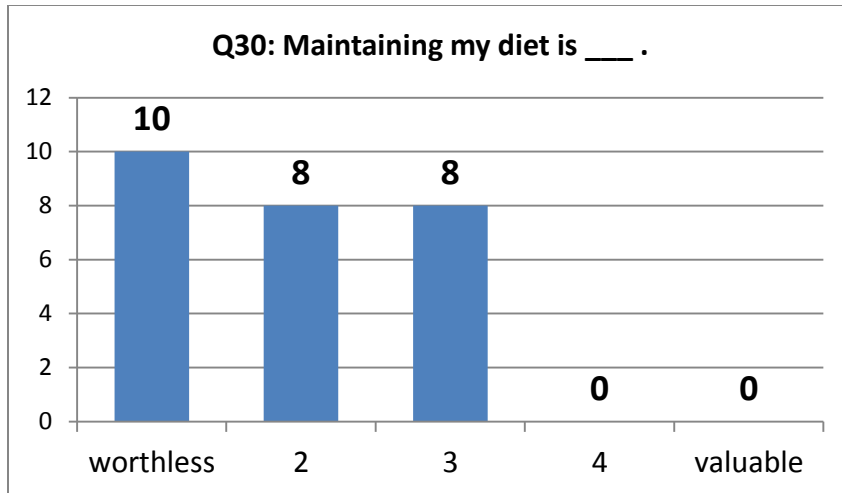


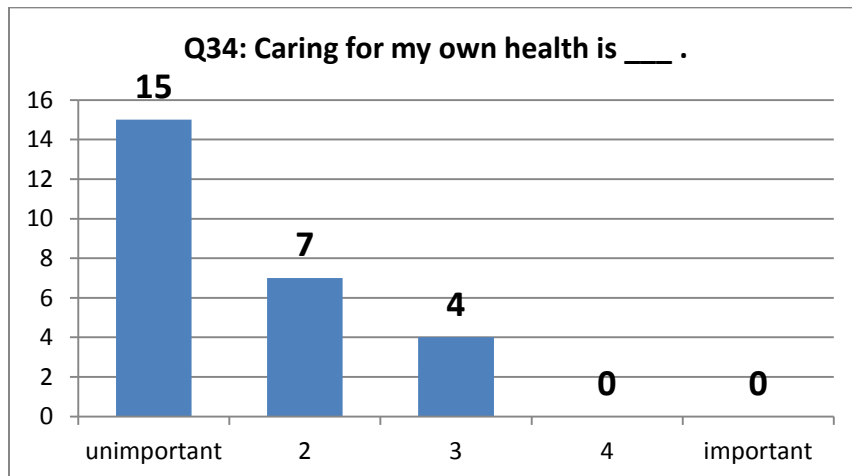
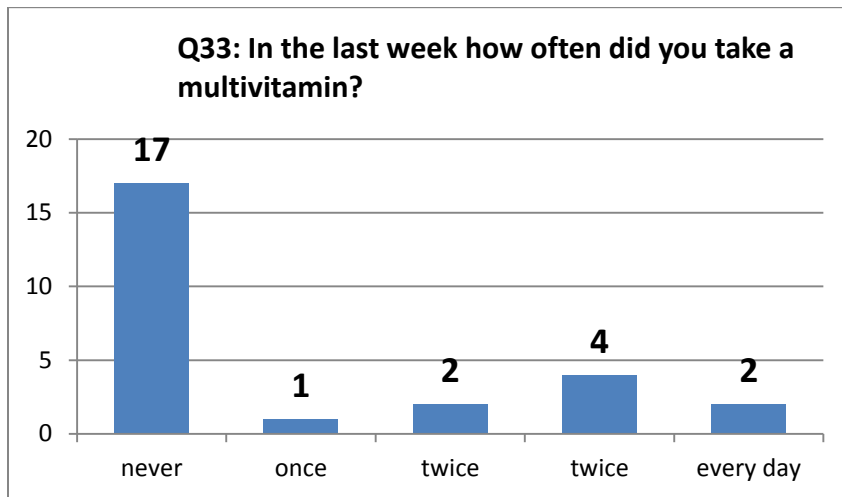
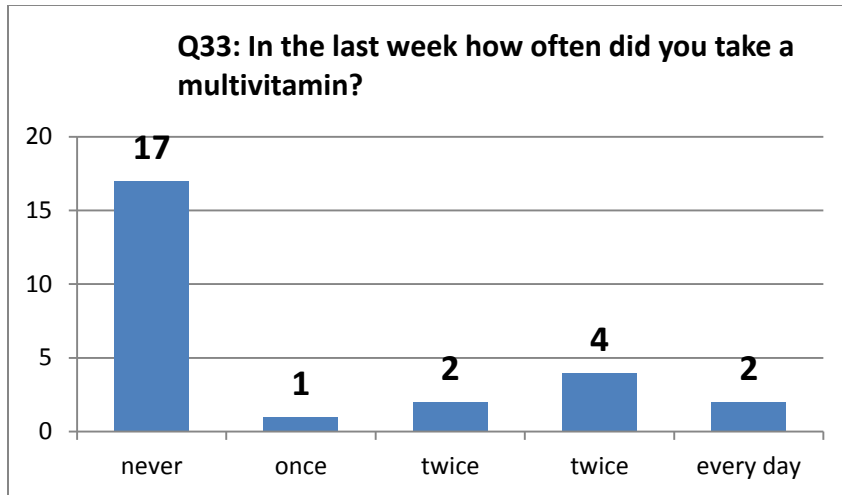


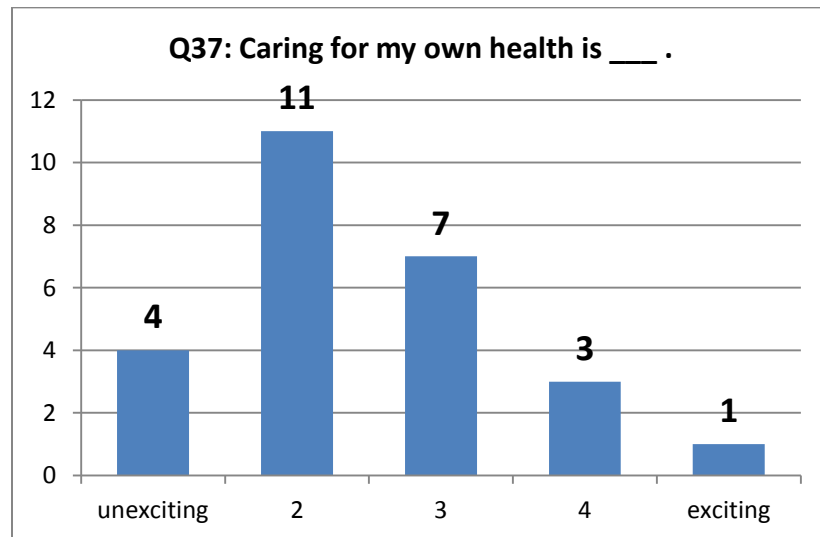
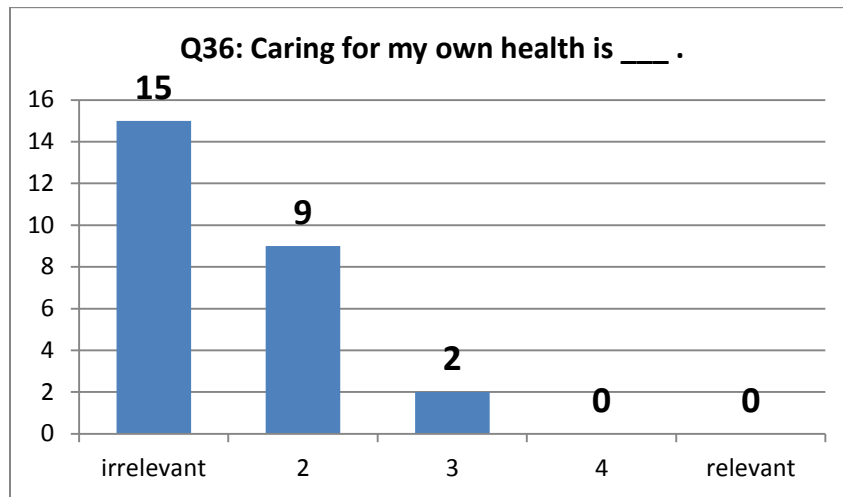
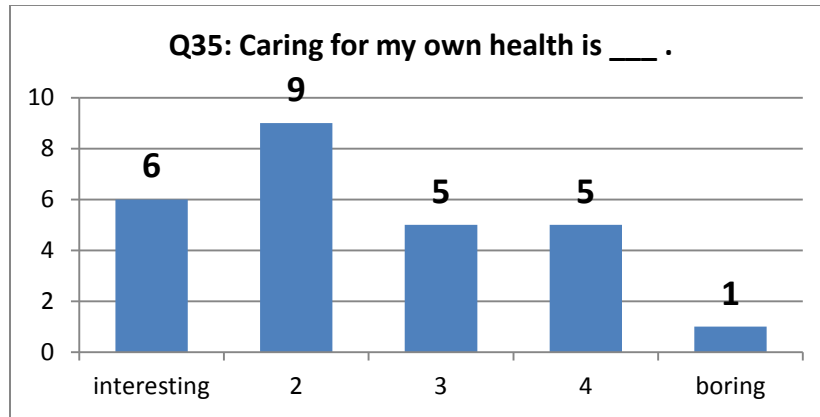


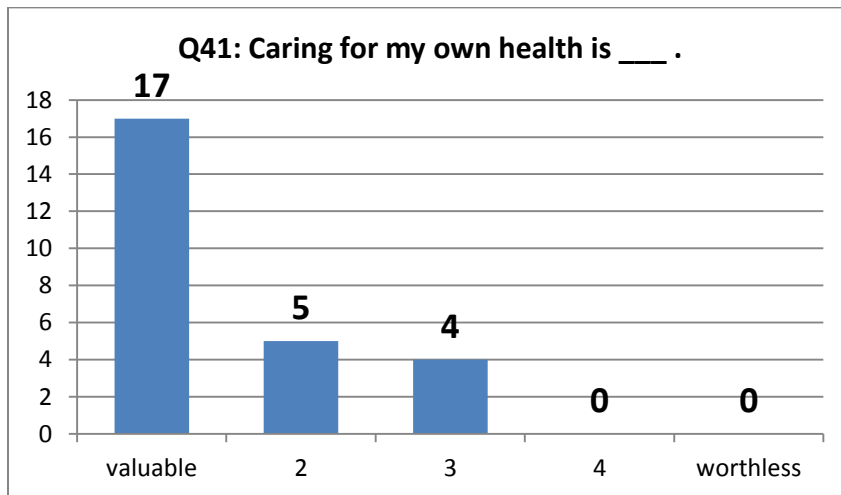
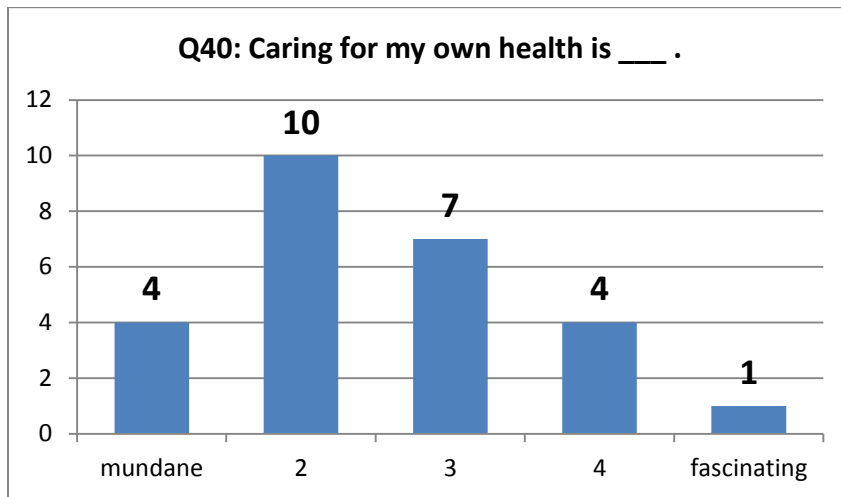
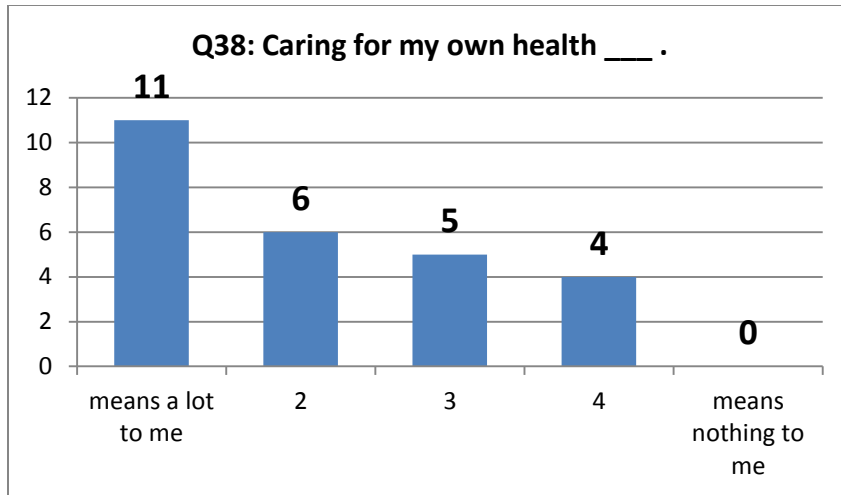


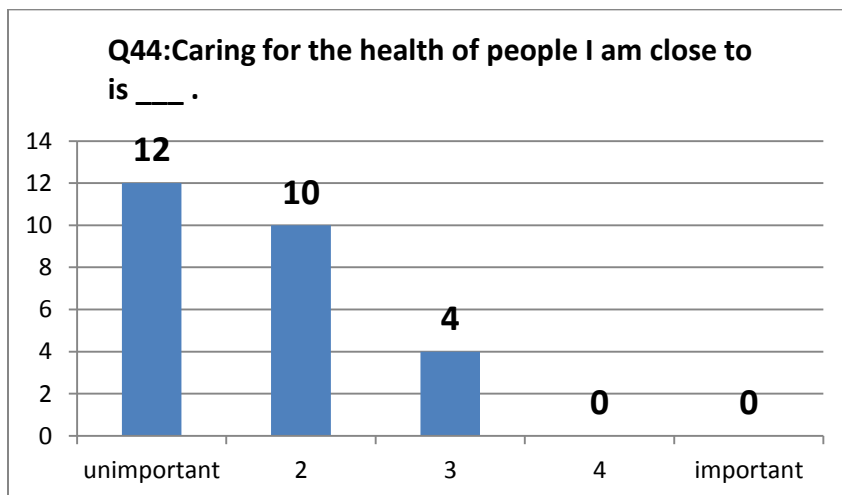
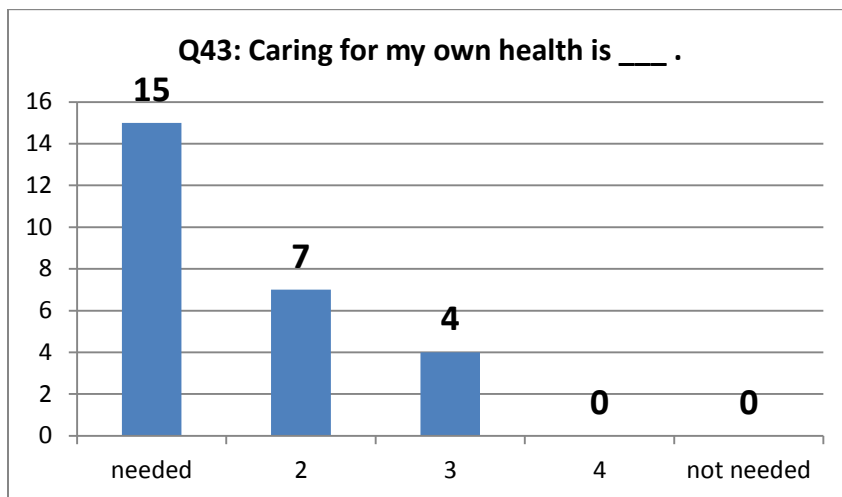
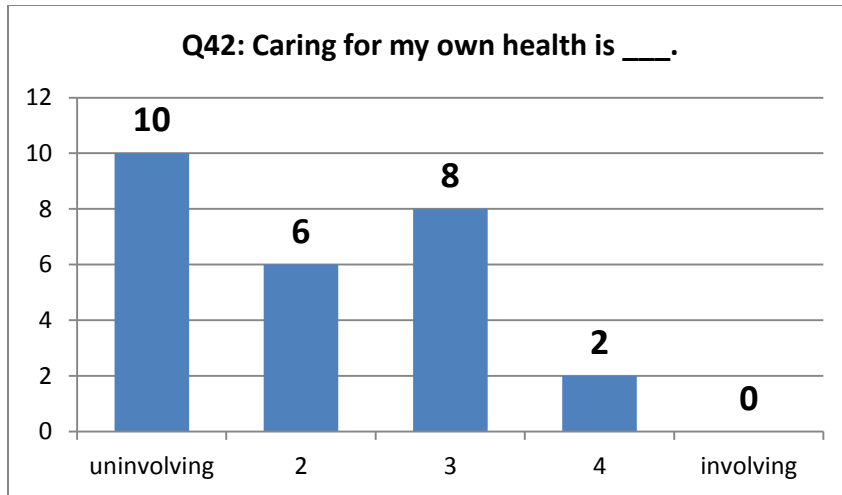


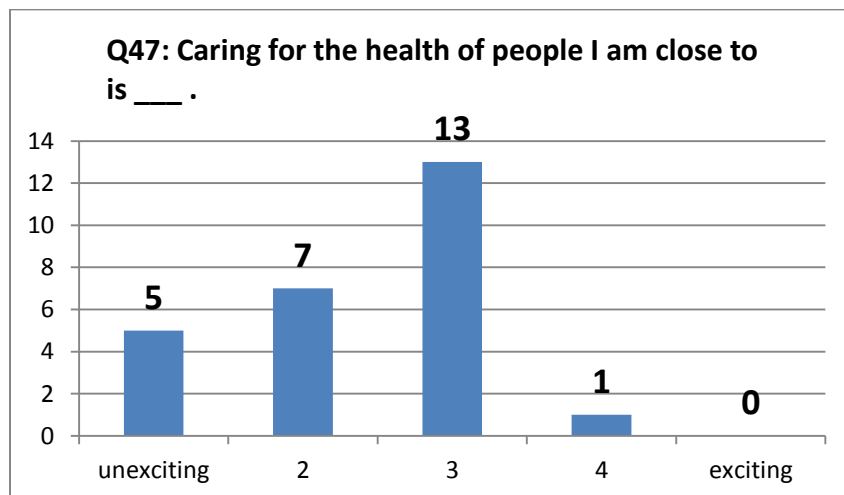
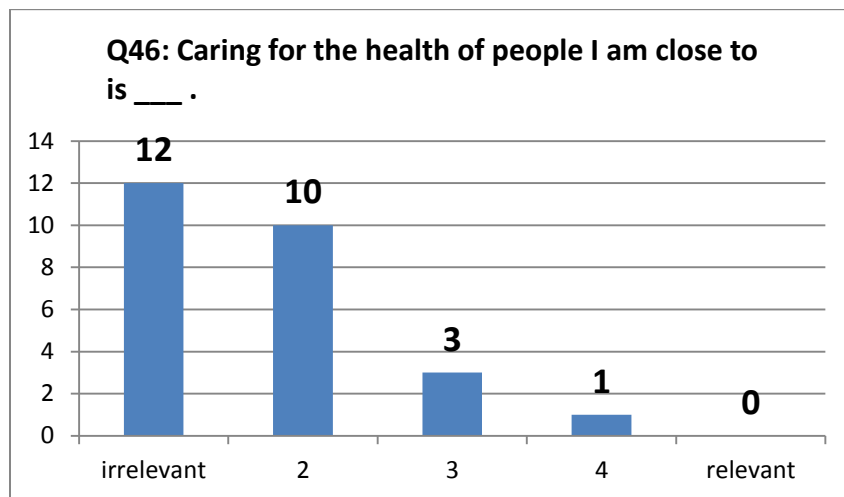
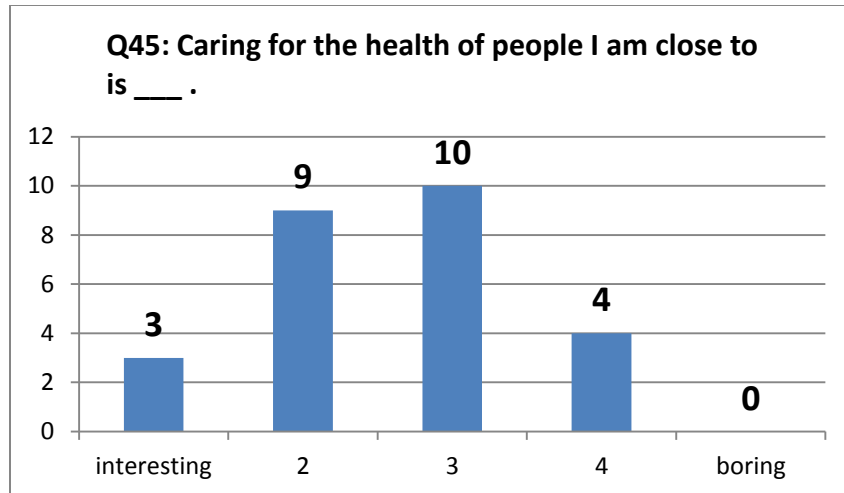


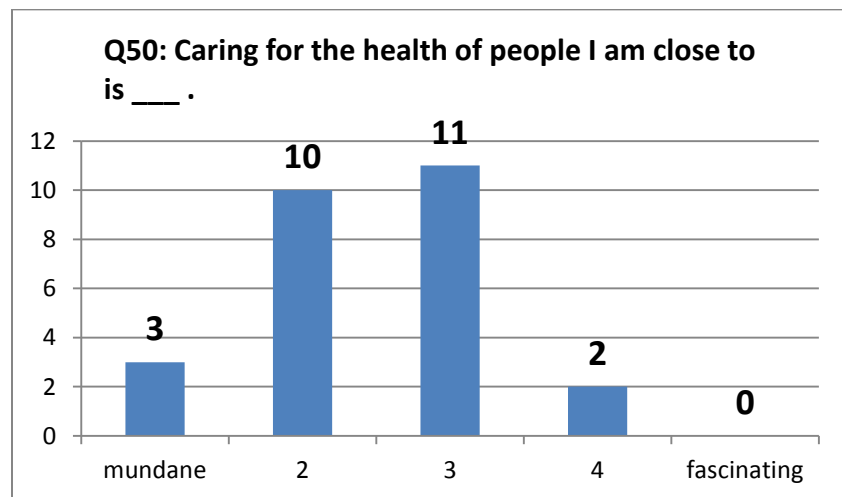
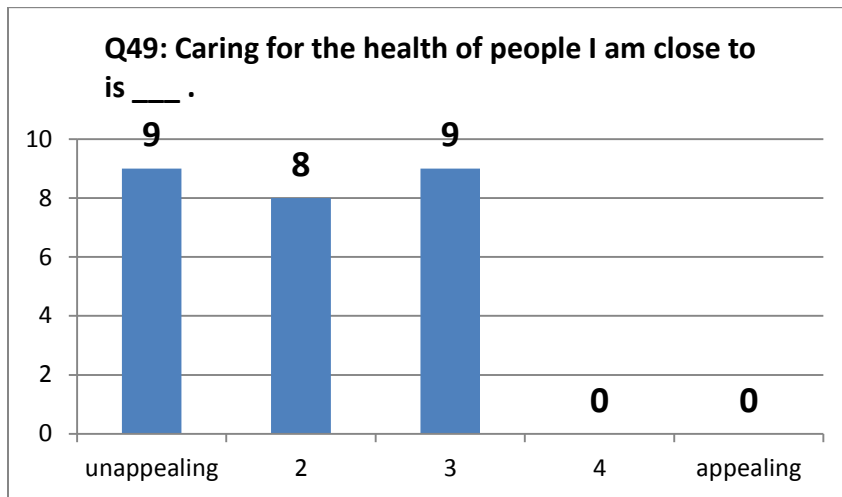
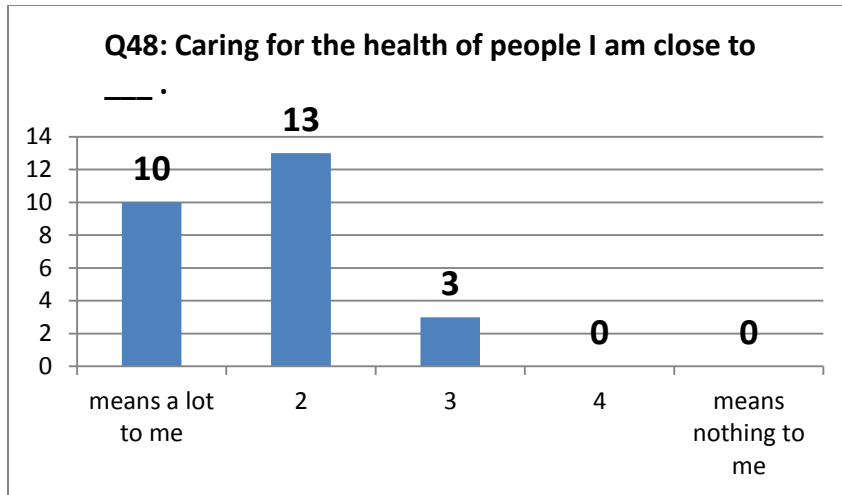


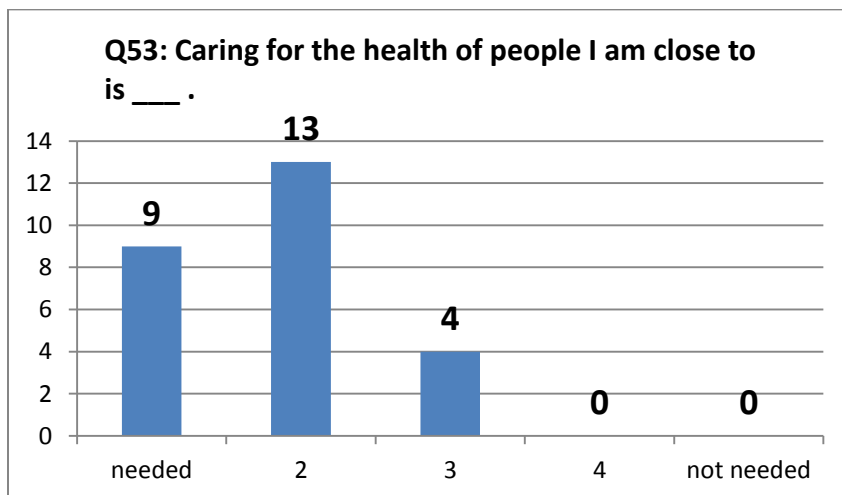
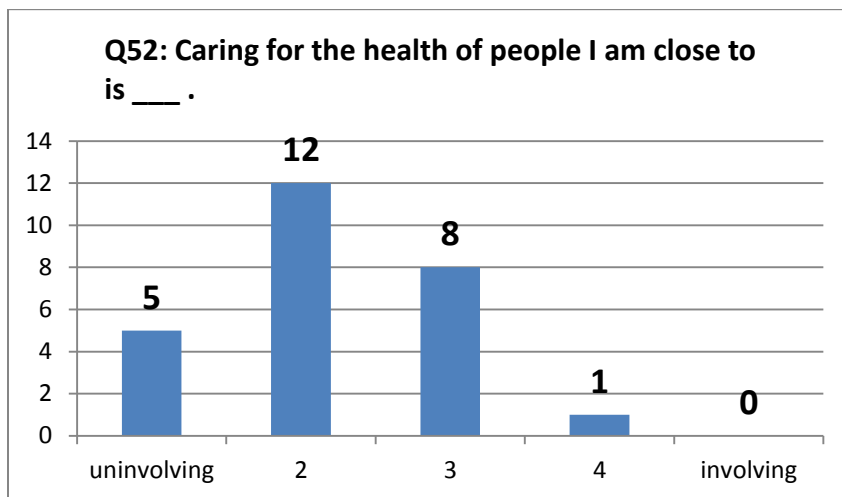
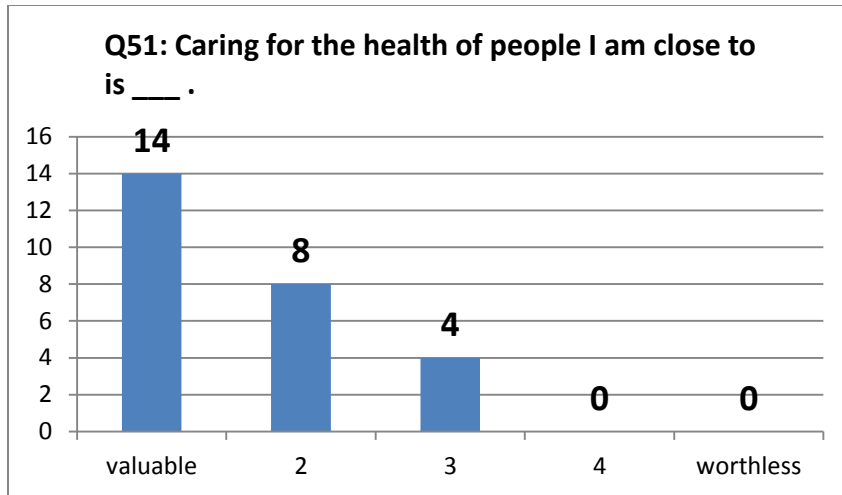




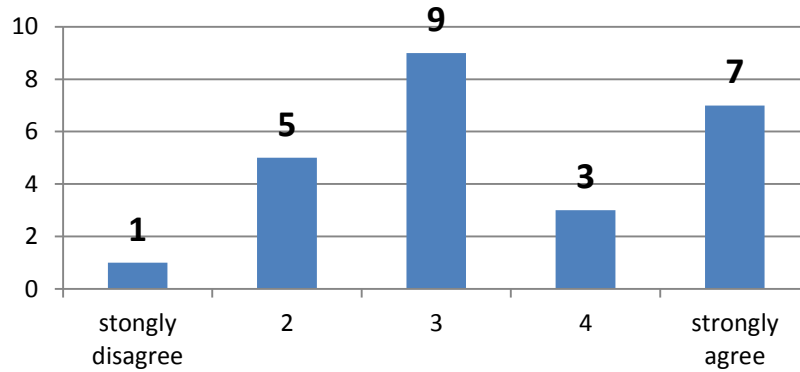




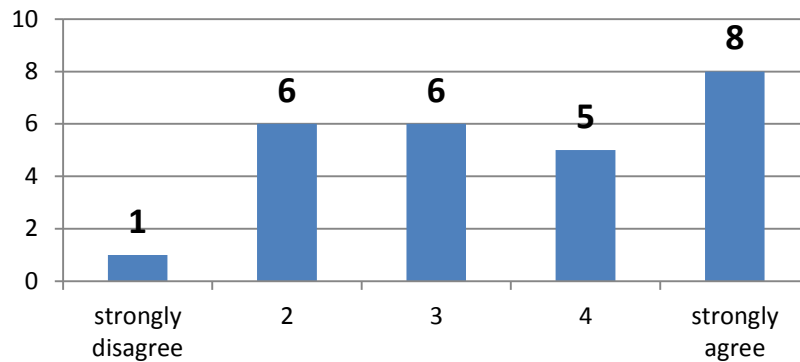




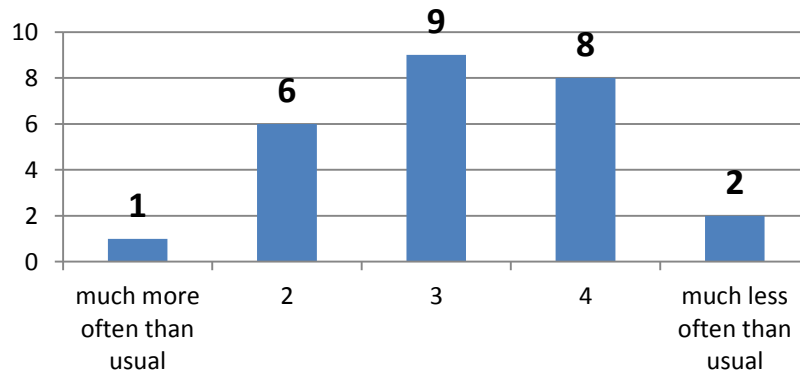
Q54: During the last year, I have been able to fully concentrate on my studies and project work.

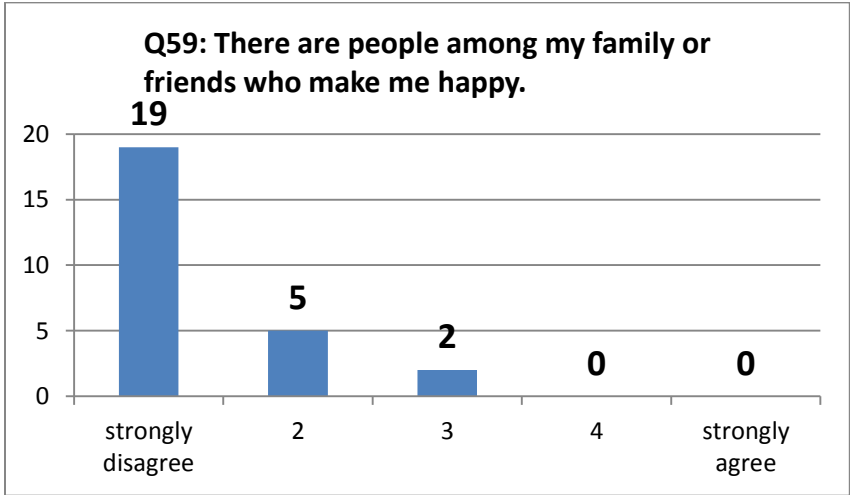
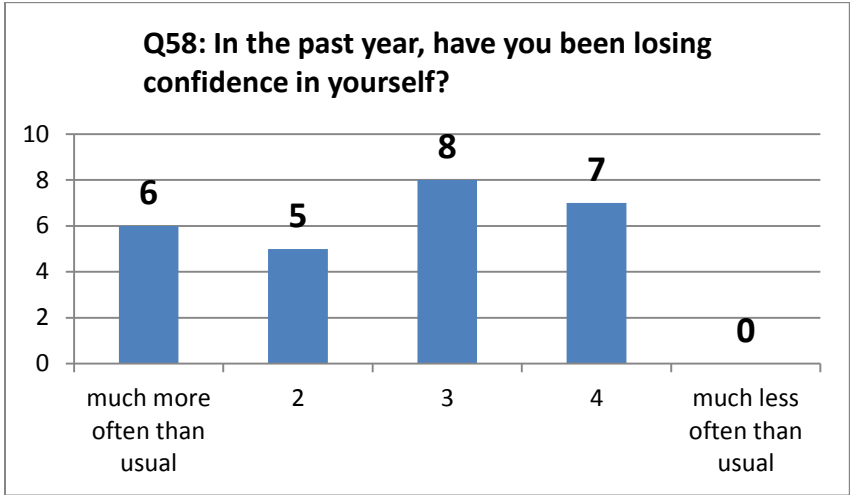
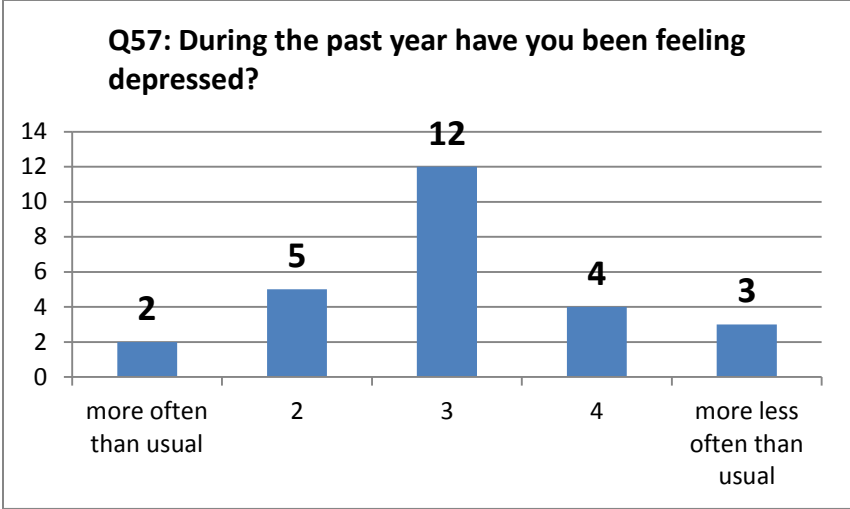


Q55: During the last year, I have lost much sleep over studying and stress.

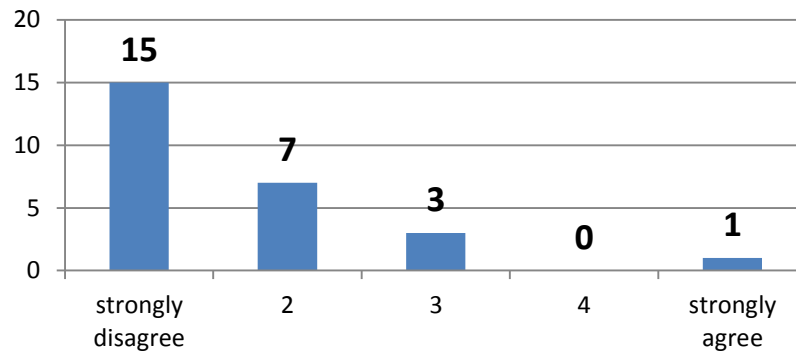


Q56: During the past year have you been feeling unhappy?

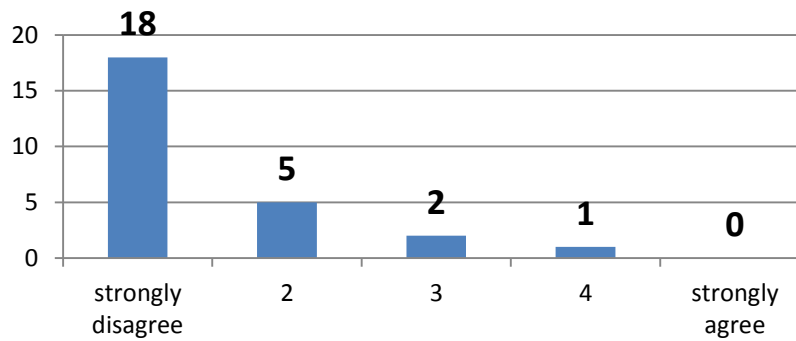




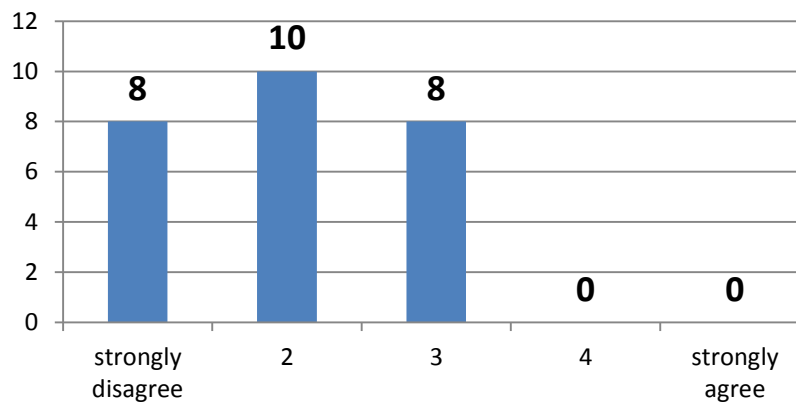
Q60: There are people among my family or friends who make me feel like an important part of their lives.

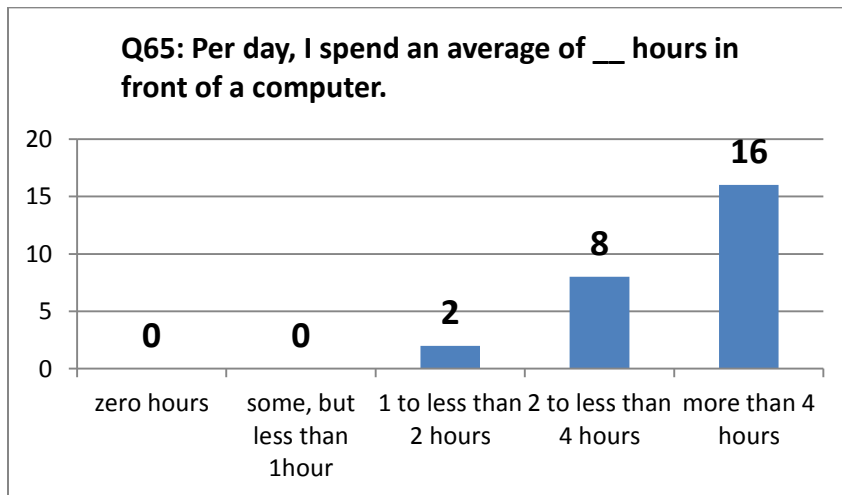
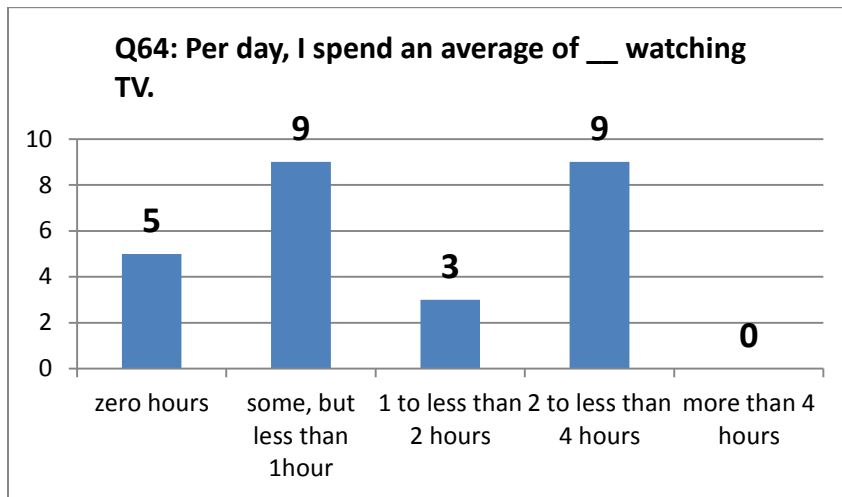
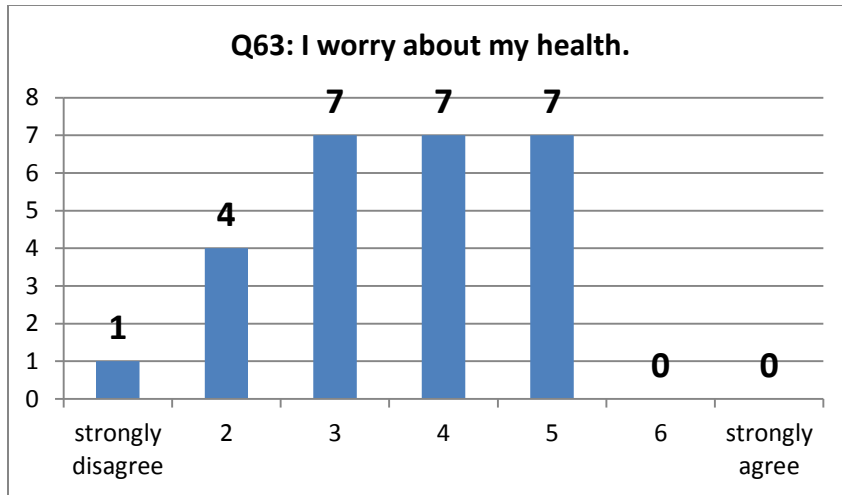


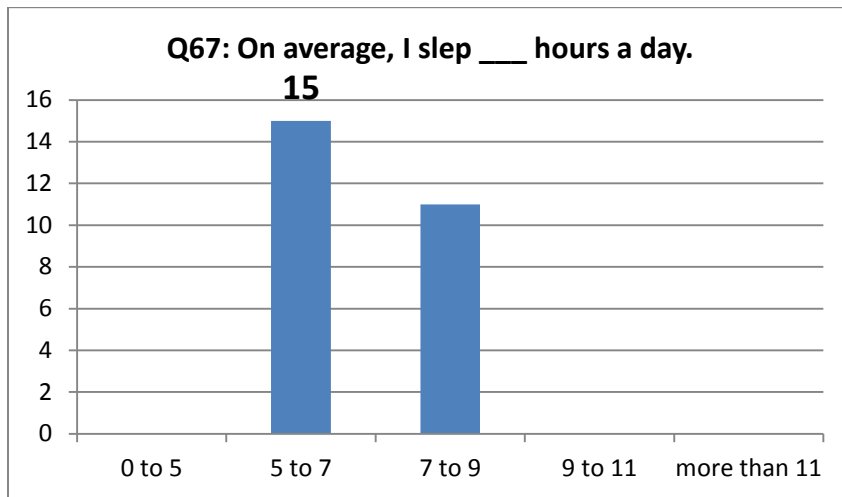
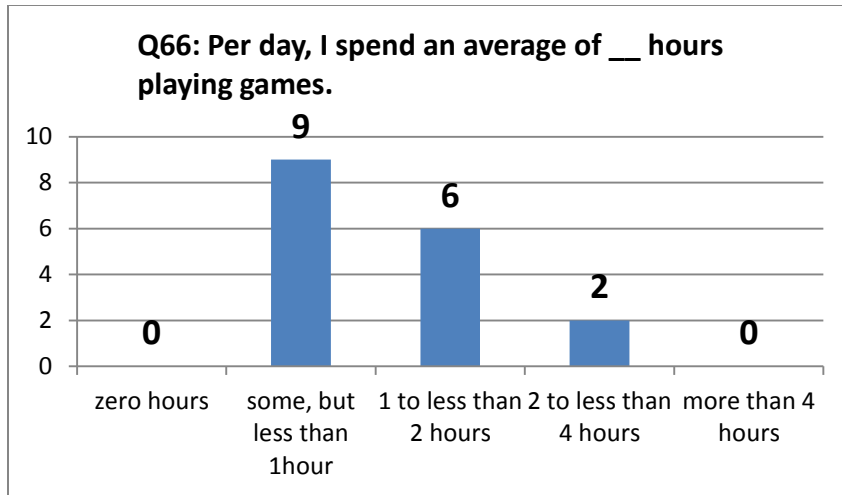
Q61: There are people among my family or friends who give me support and encouragement.

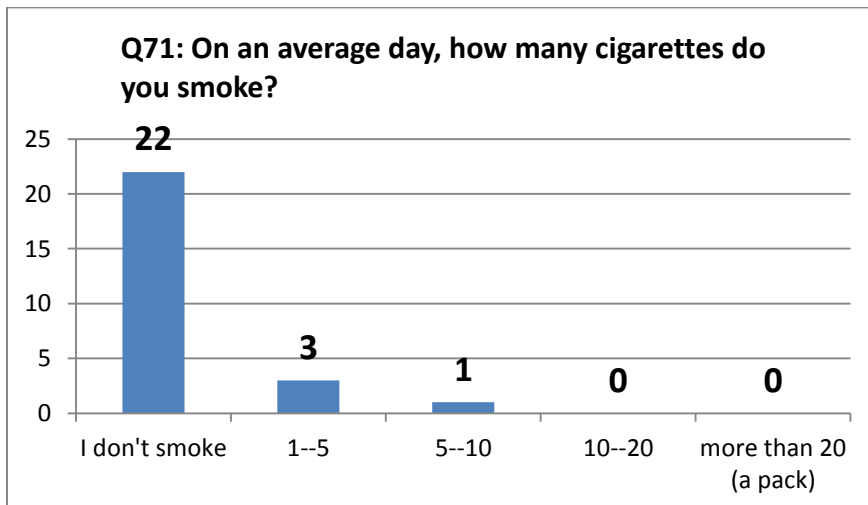
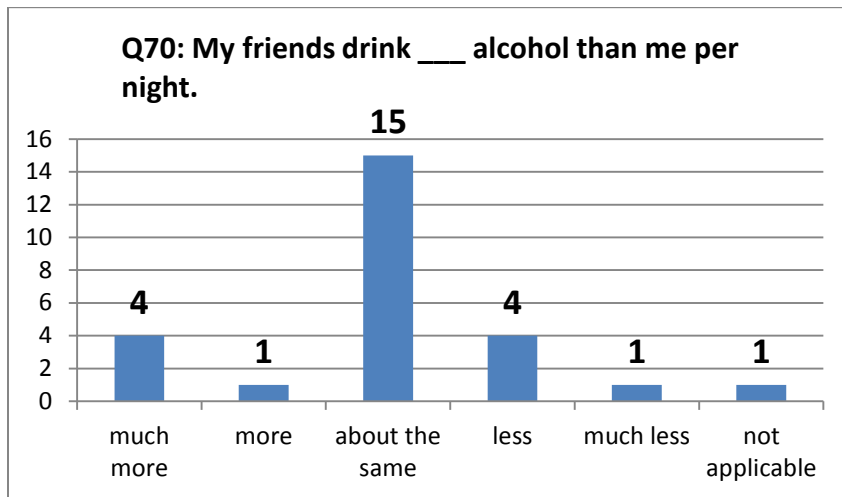
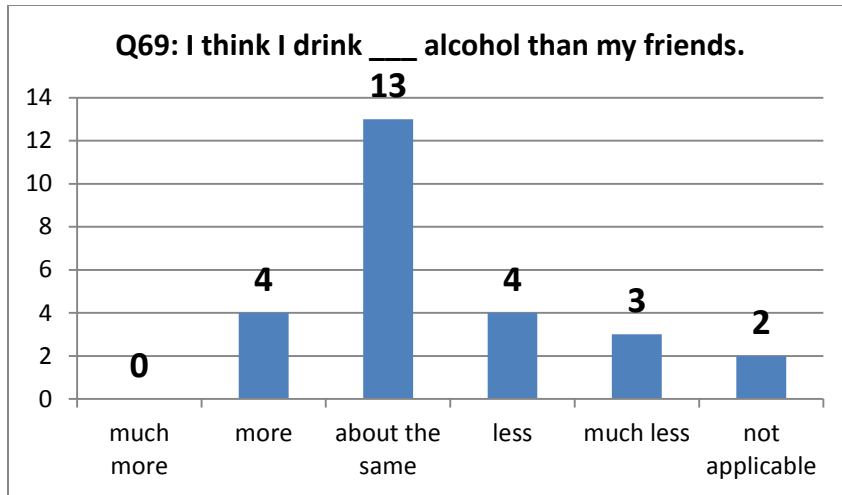


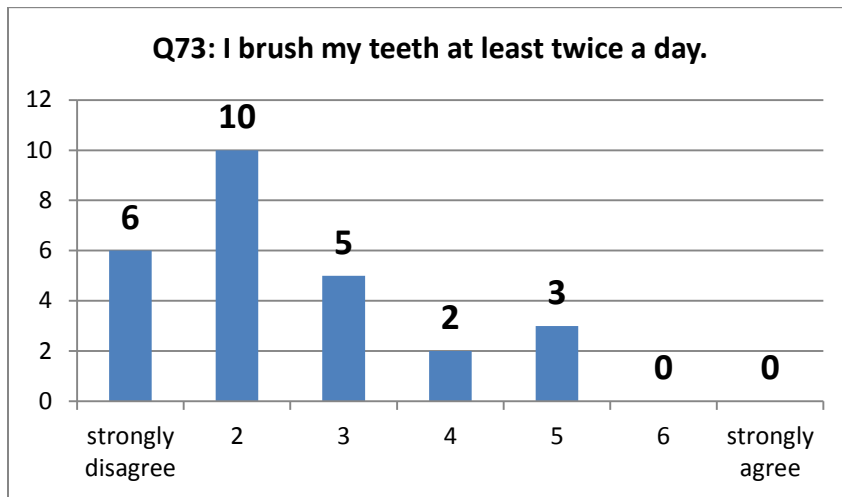
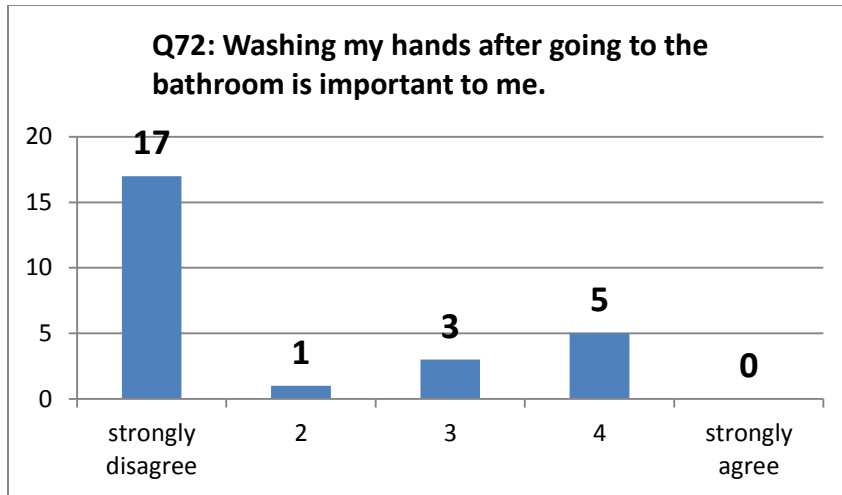
Q62: My own health is of great concern to me.

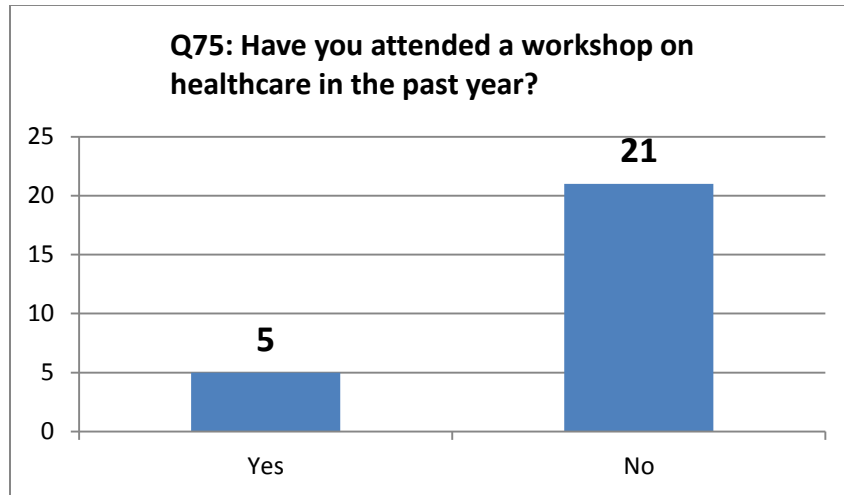




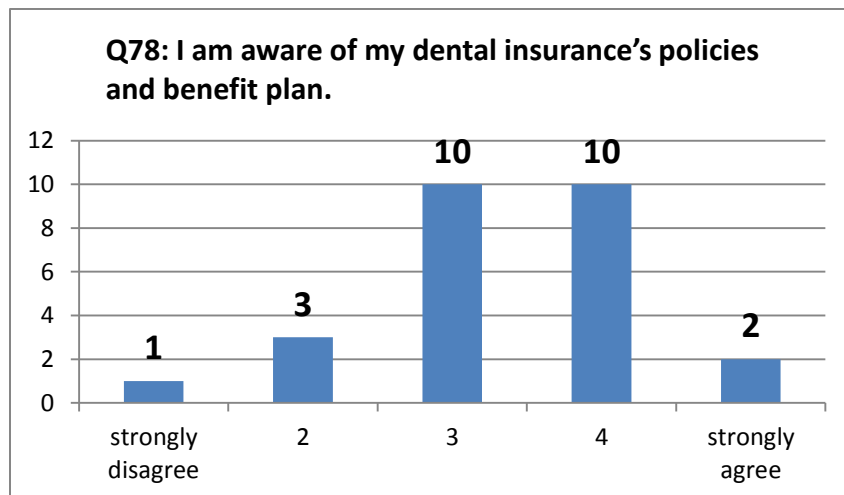
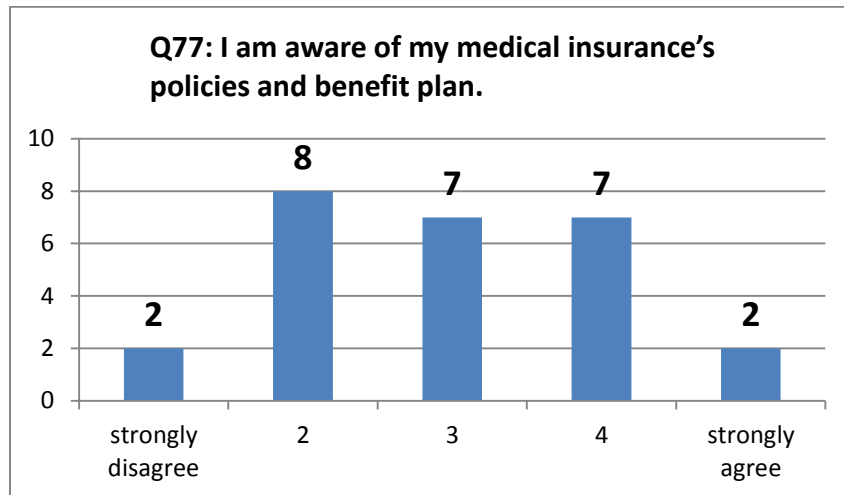




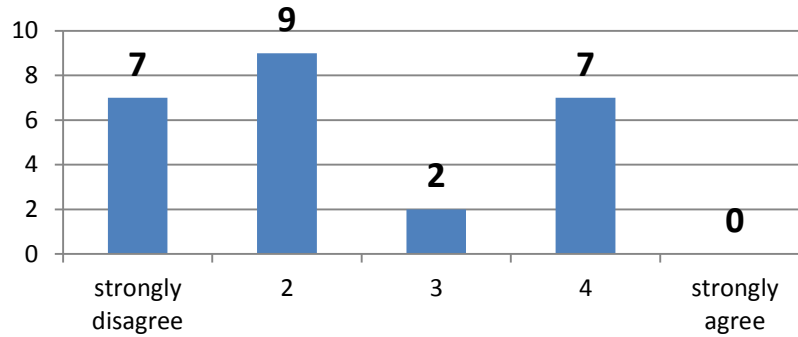




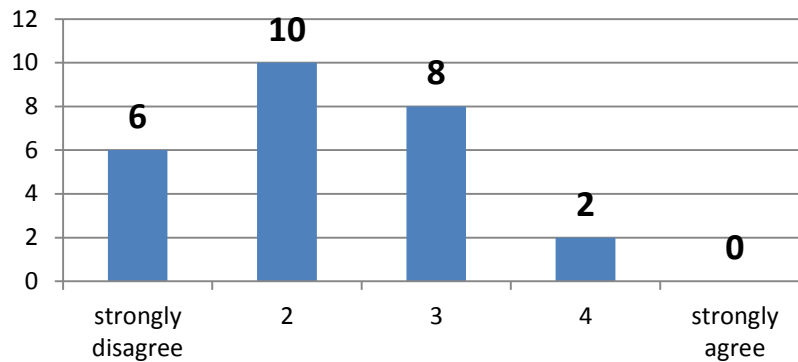
Q76: How do you educate yourself on personal healthcare topics?



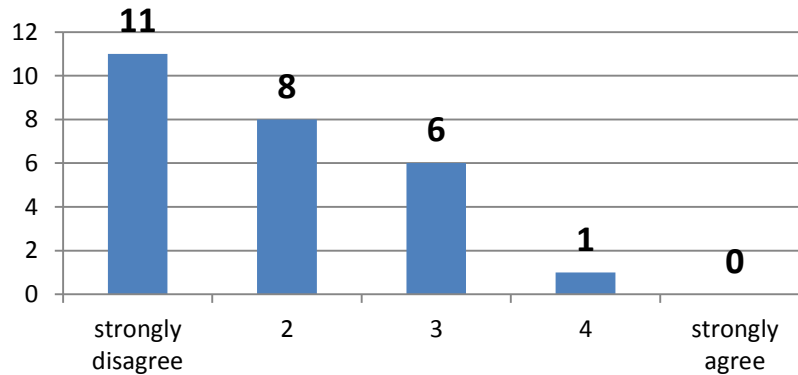
Q79: The people I am close to have provided me with useful information on personal healthcare topics.



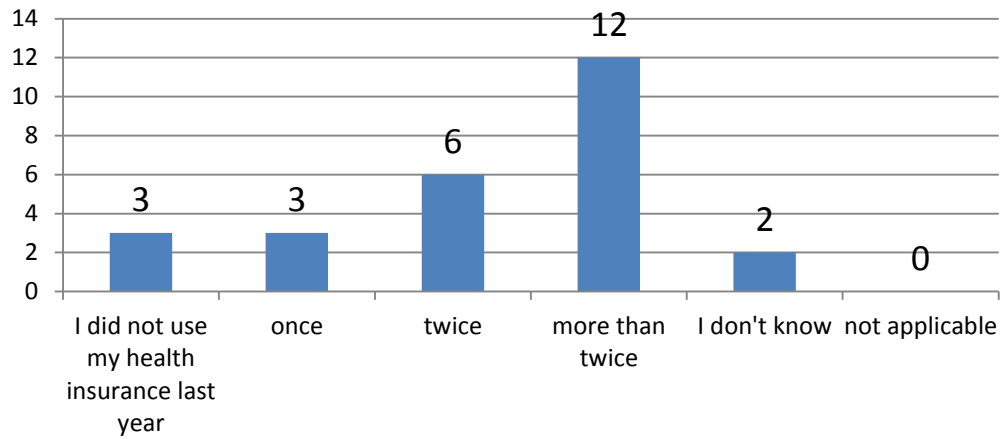
Q80: I always trust the healthcare information I receive from people I am close to.



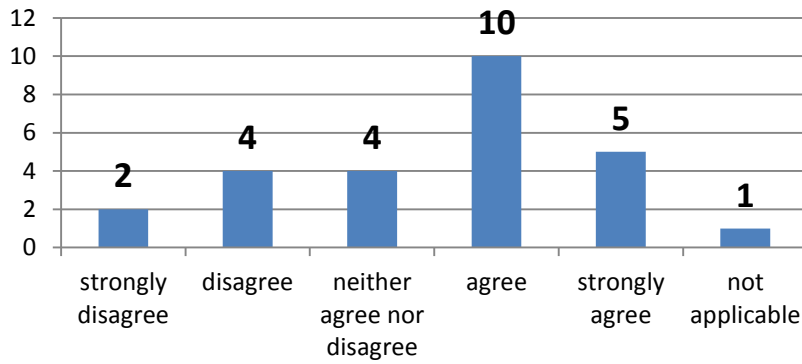
Q81: I always trust the healthcare information I receive from my primary care physician.



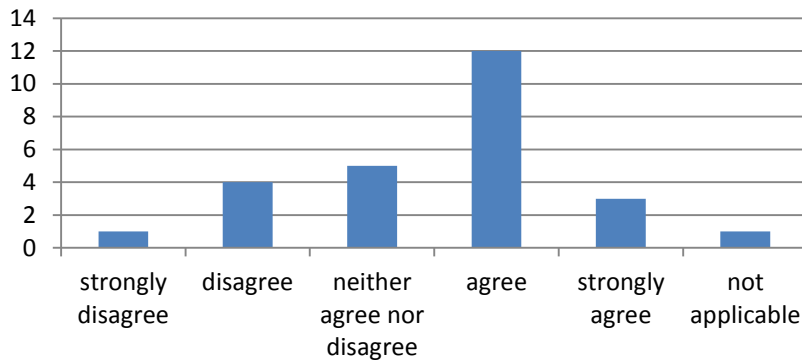
Q82: Last year, how many times did you use health insurance to obtain medical or dental care?



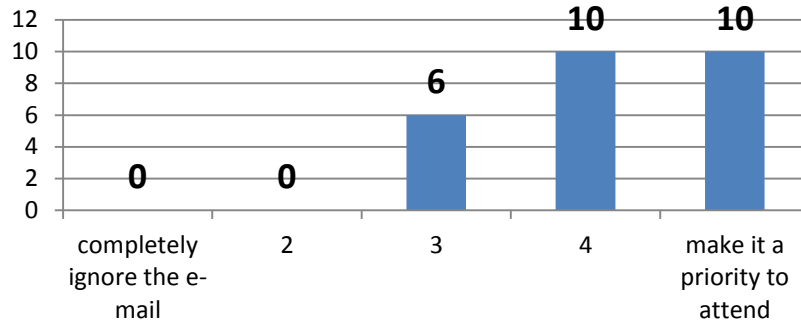
Q83: My high school biology courses have benefited my health awareness.



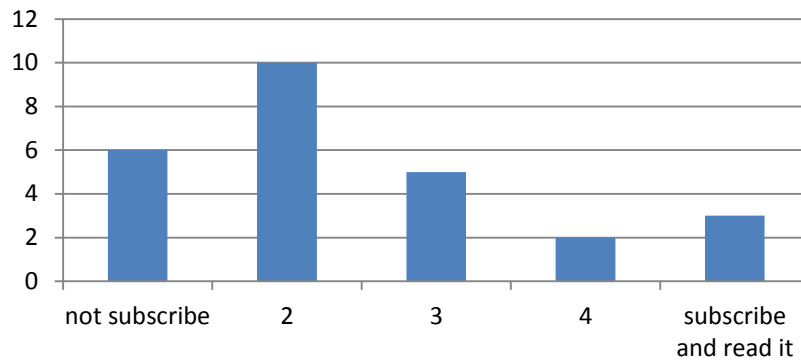
Q84: My high school health courses have benefited my health awareness.



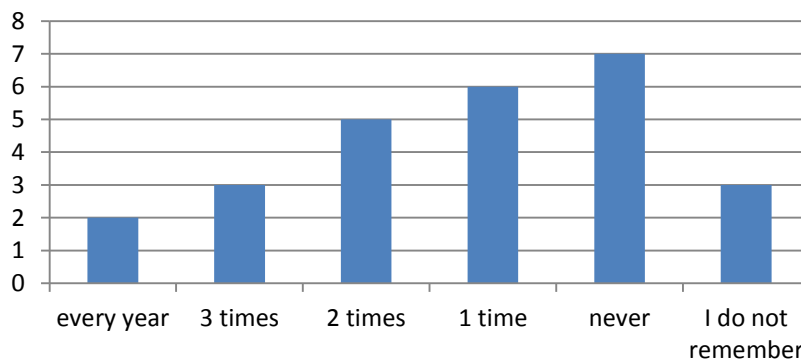
Q85: If the Campus Health Center sends an email announcing a workshop on personal well-being and health decision, I would ____ .

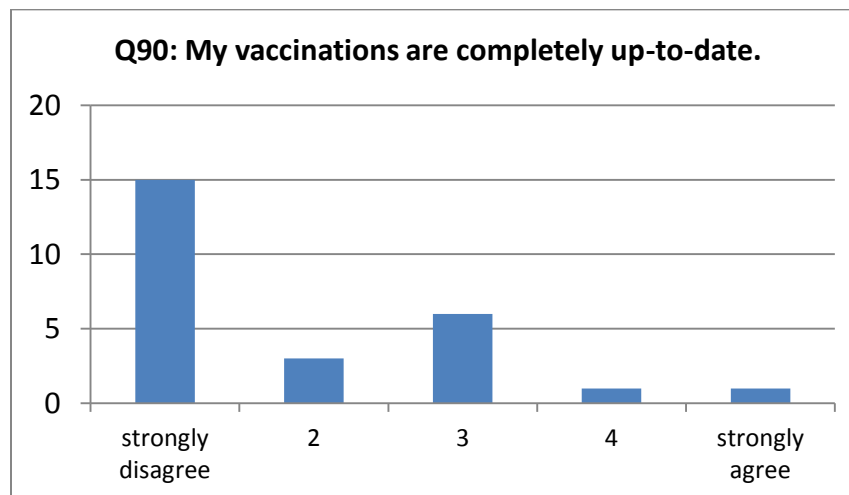
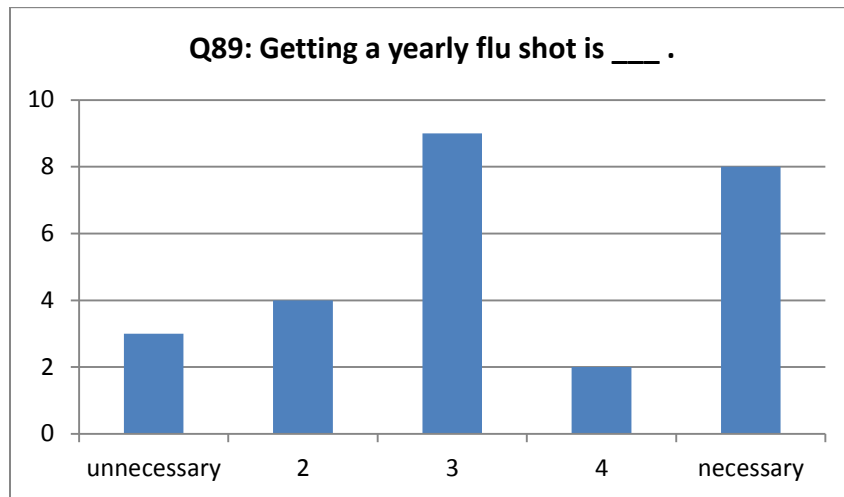
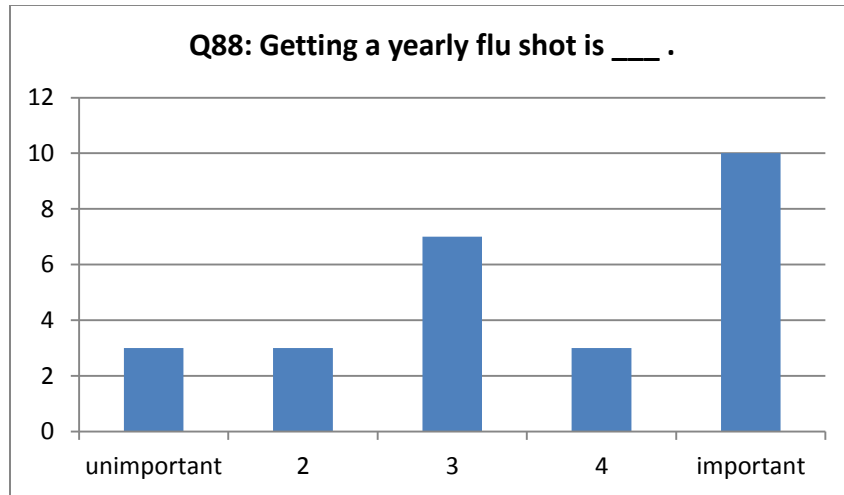


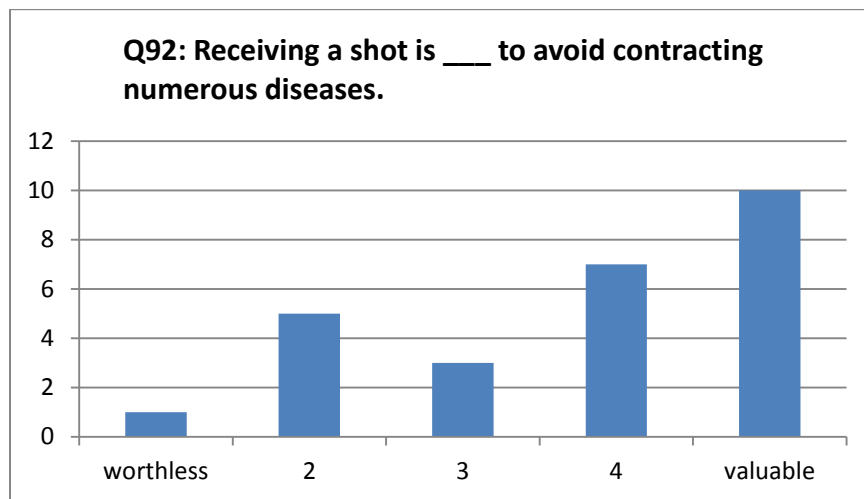
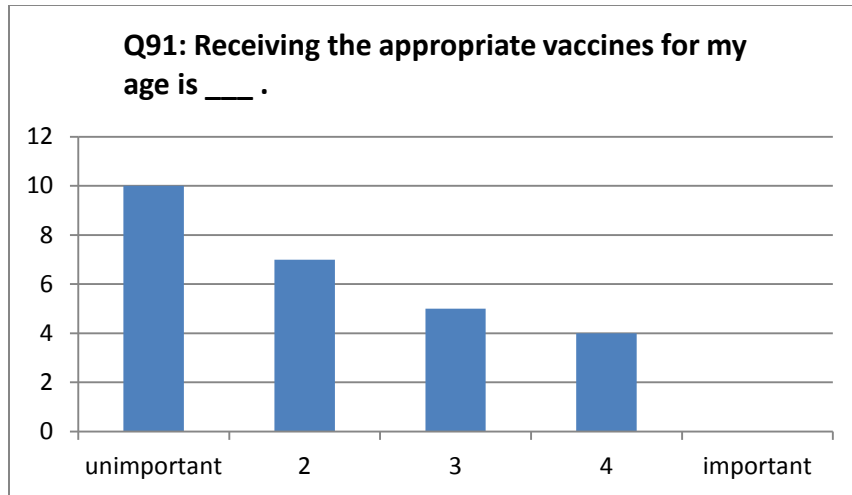
Q86: If I am provided with a free subscription for one of the popular health magazine, I would ____ .



Q87: During the last 4 years, I have gotten a flu shot ____ .



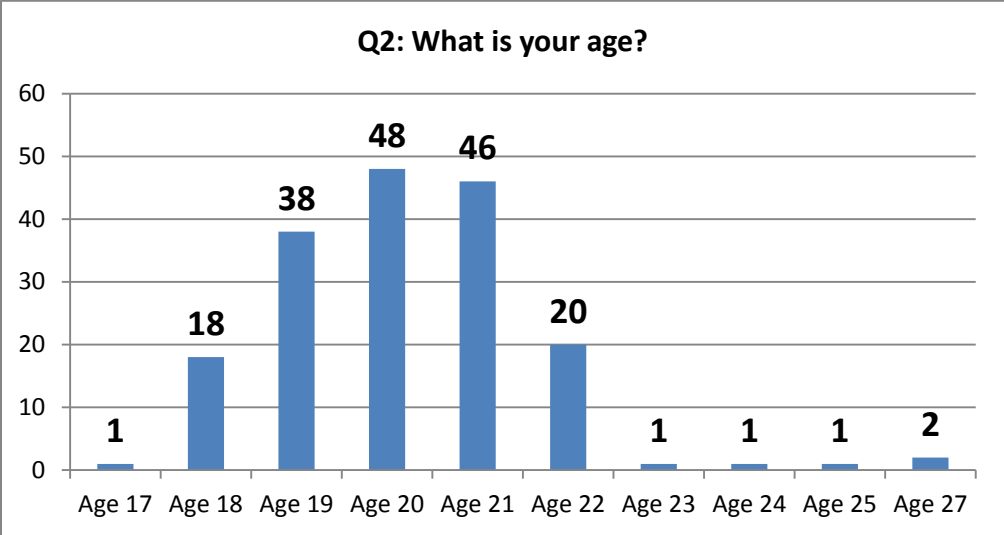
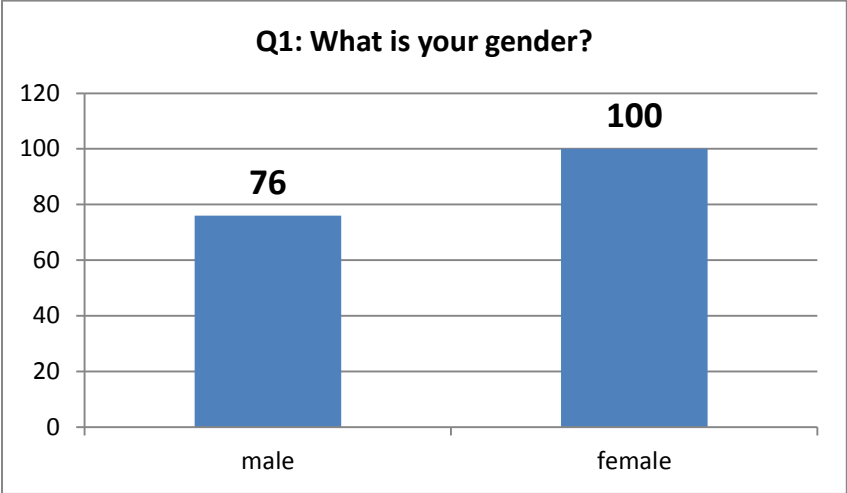


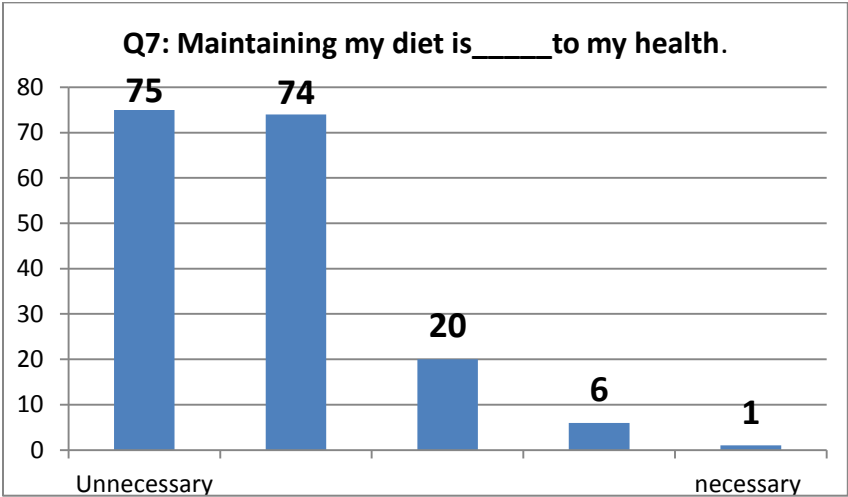
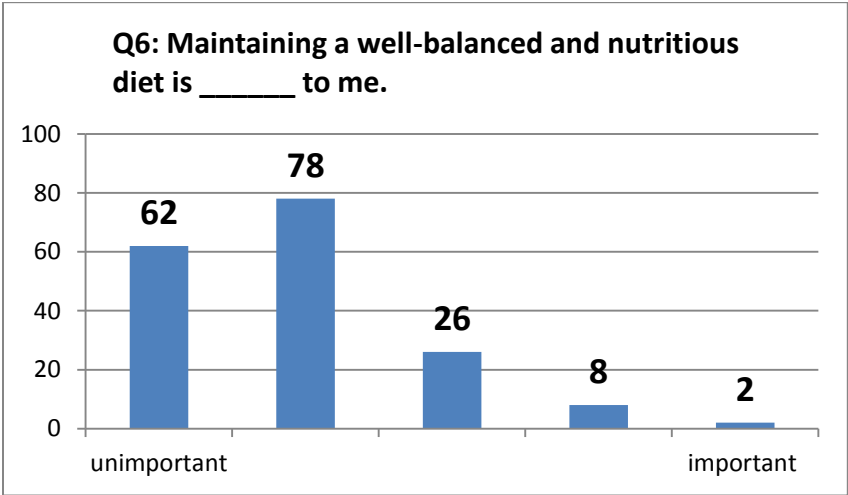
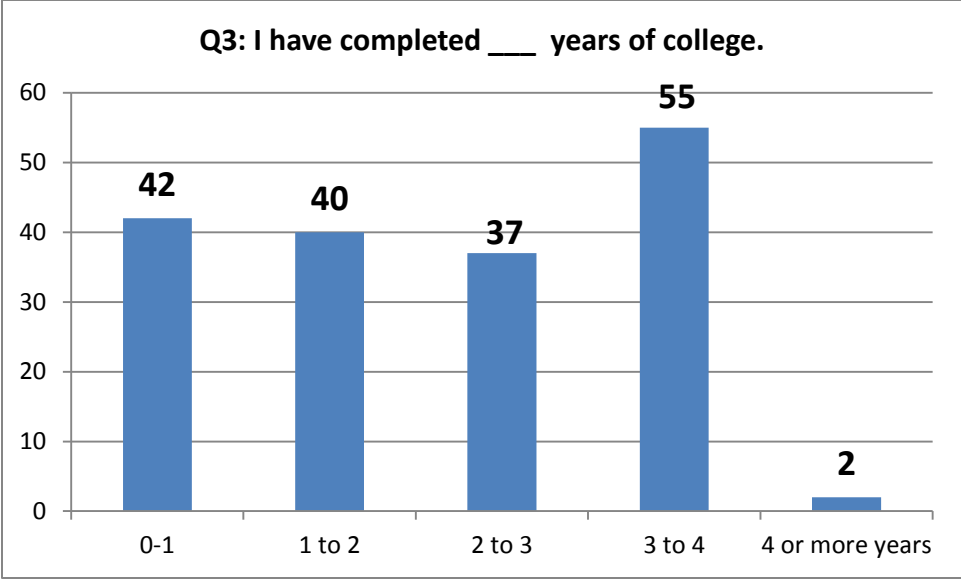


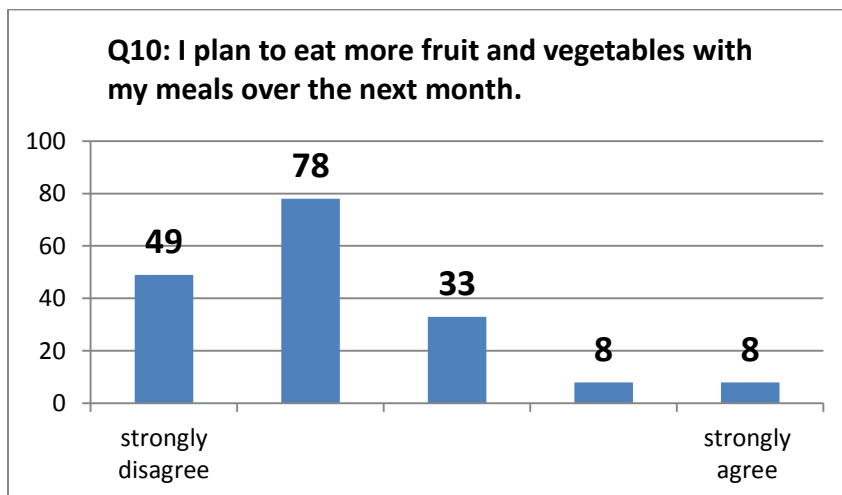
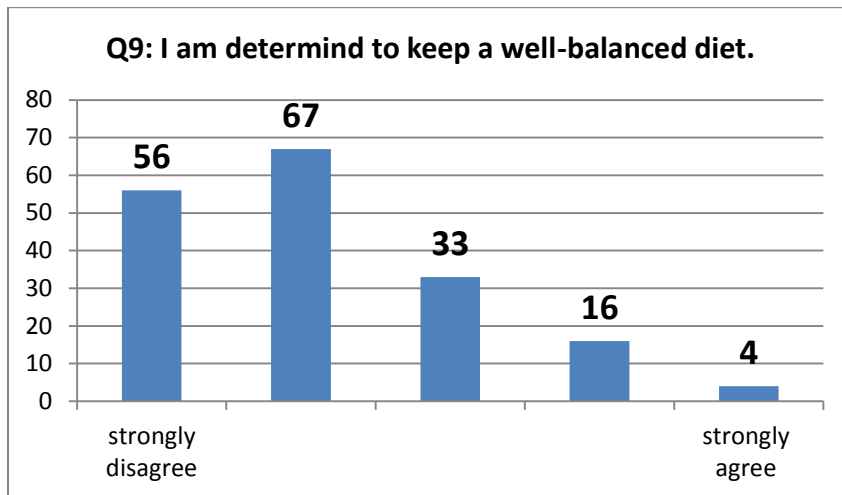
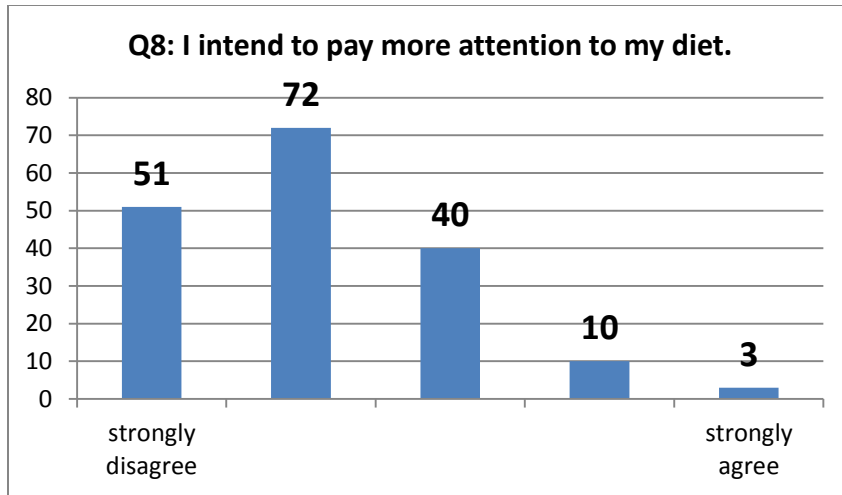
Q93: List the aspects of your healthcare that are most engaging to you.

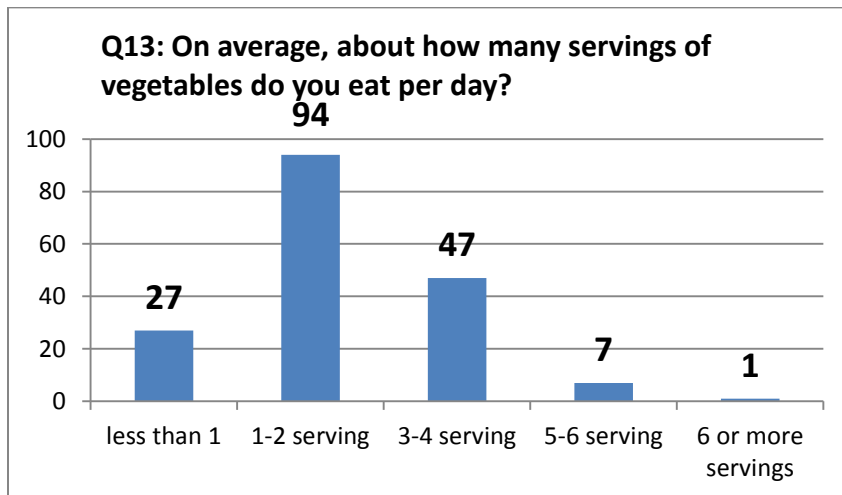
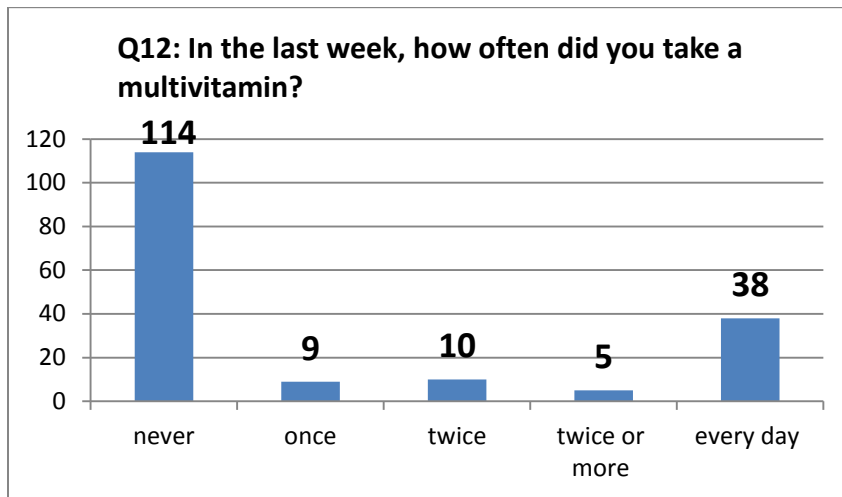
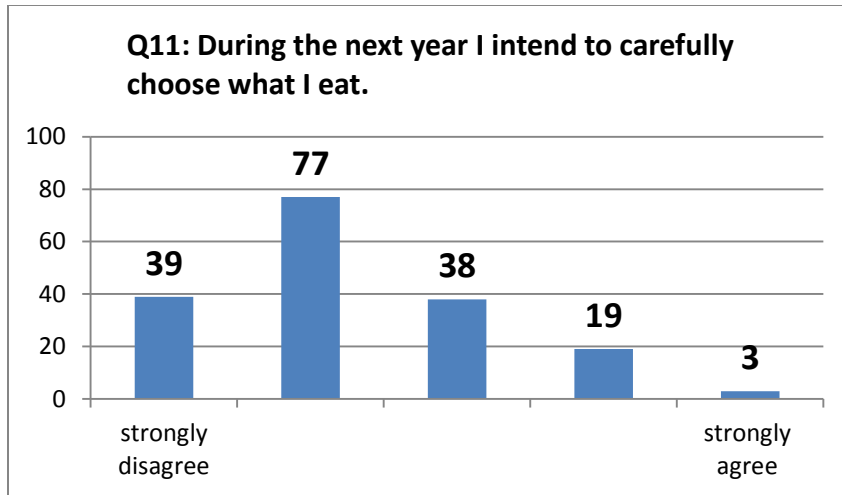
Q94: List any specific actions you plan to take to stay healthy during the current year.

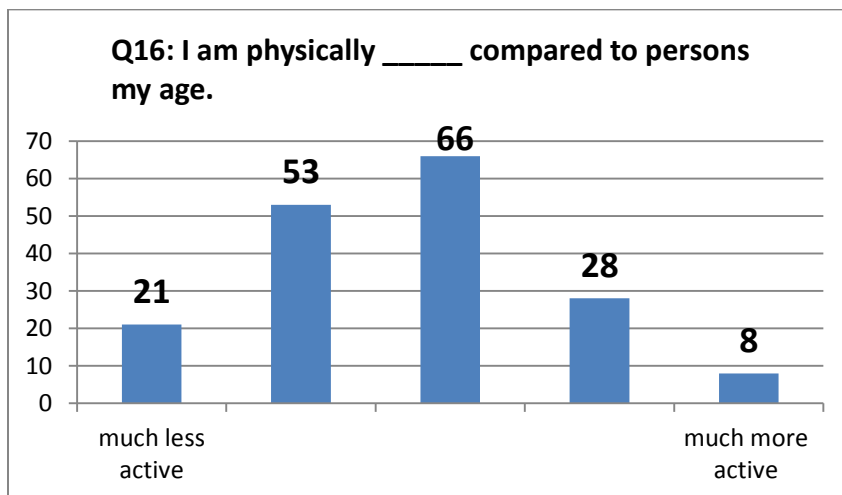
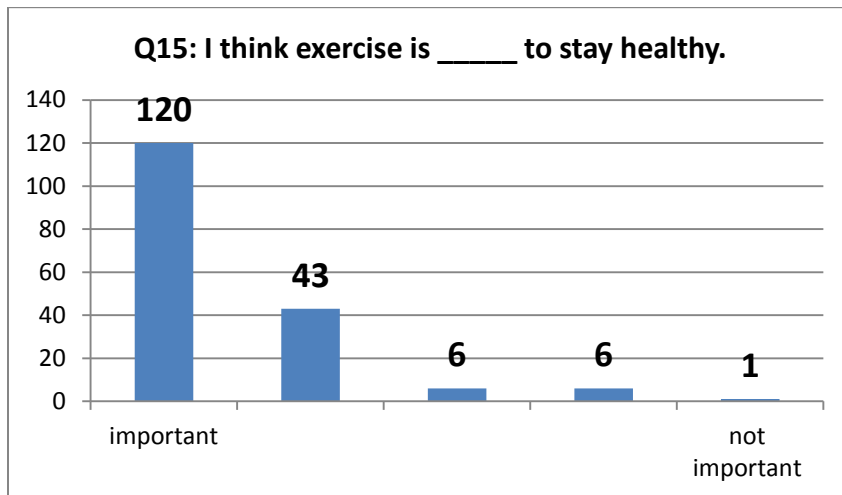
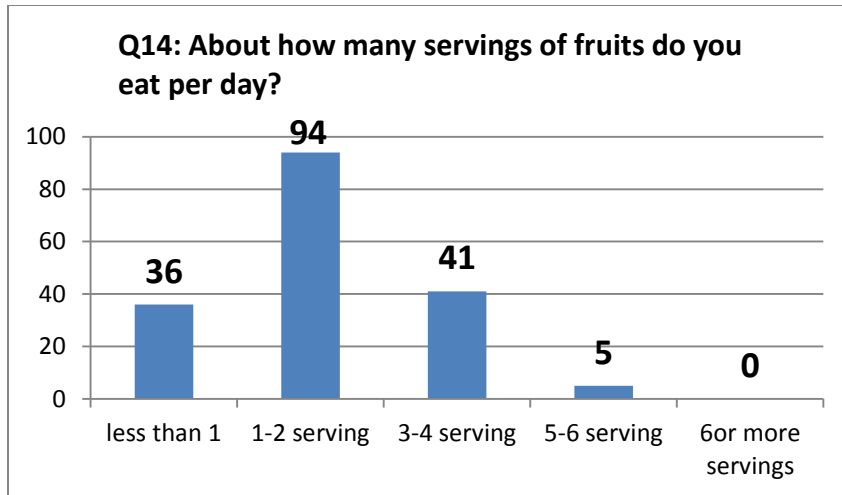
Appendix B: Campus-wide Survey Results

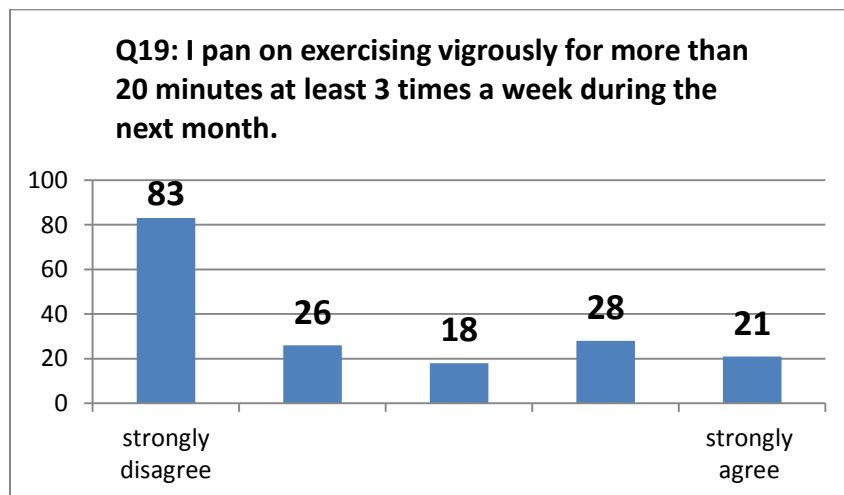
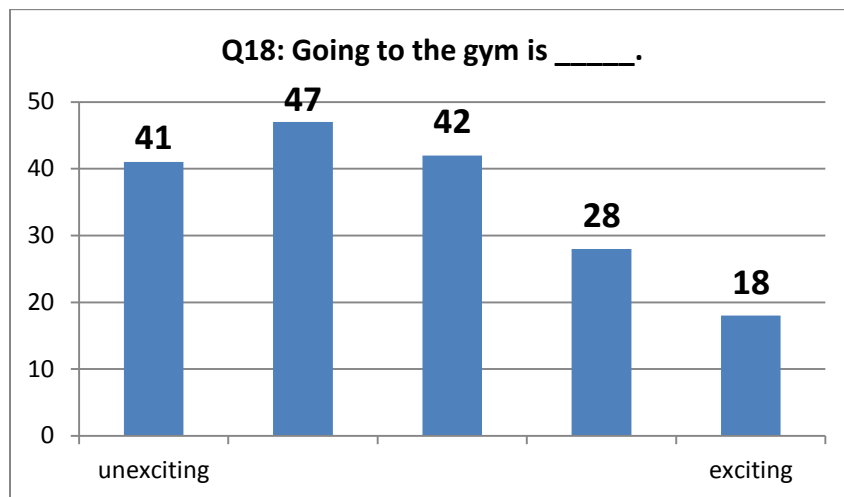
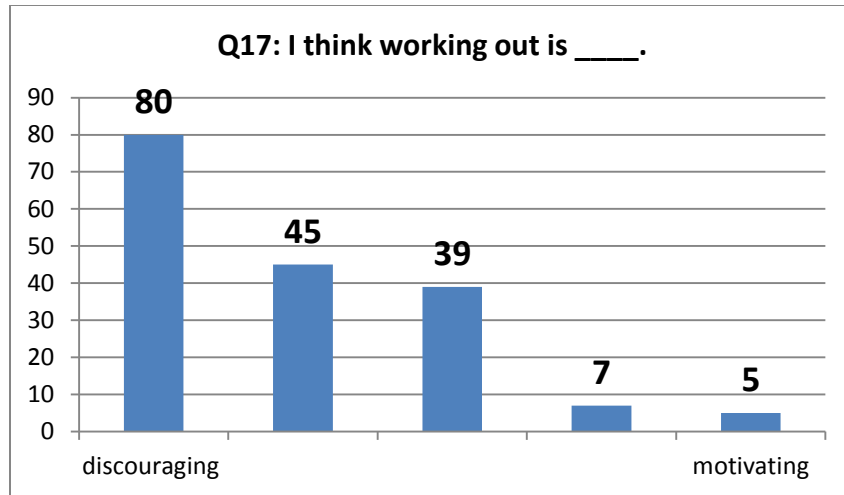


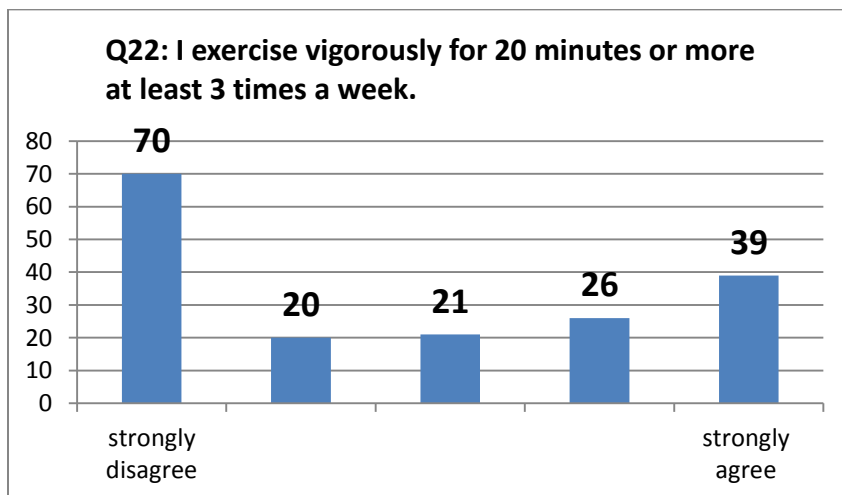
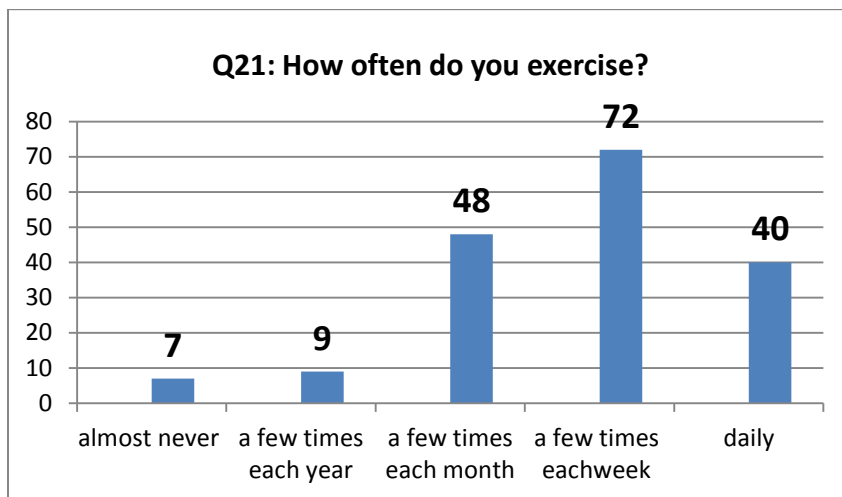
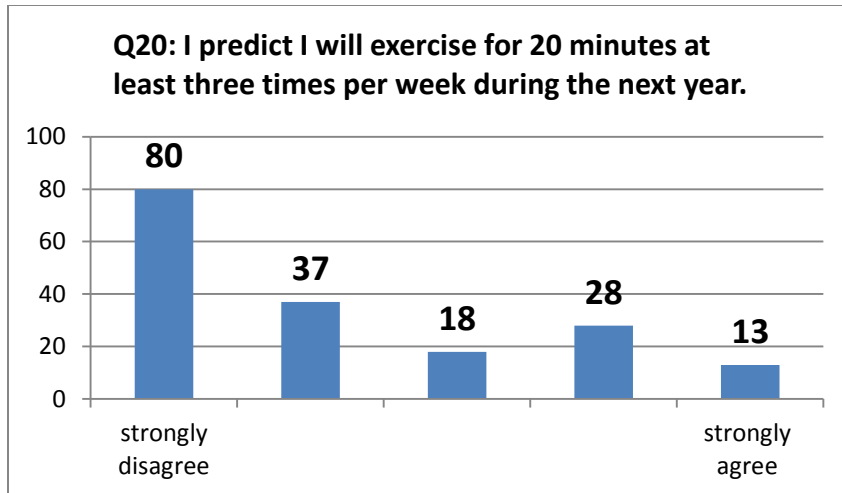


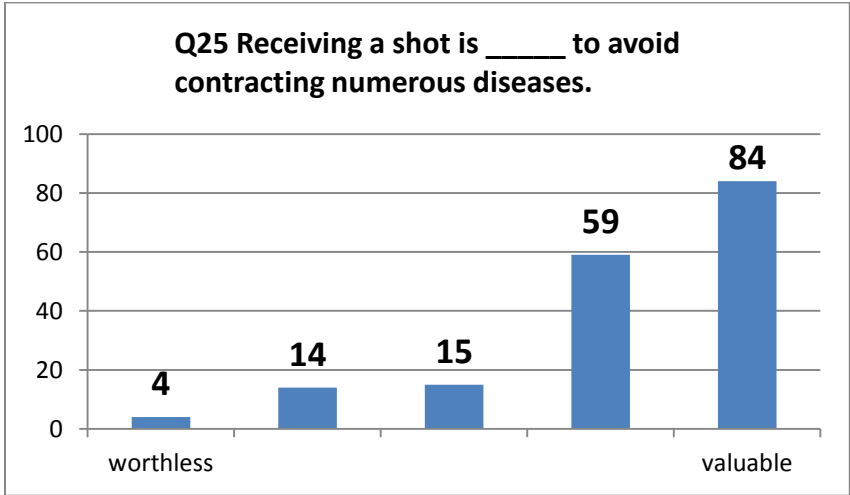
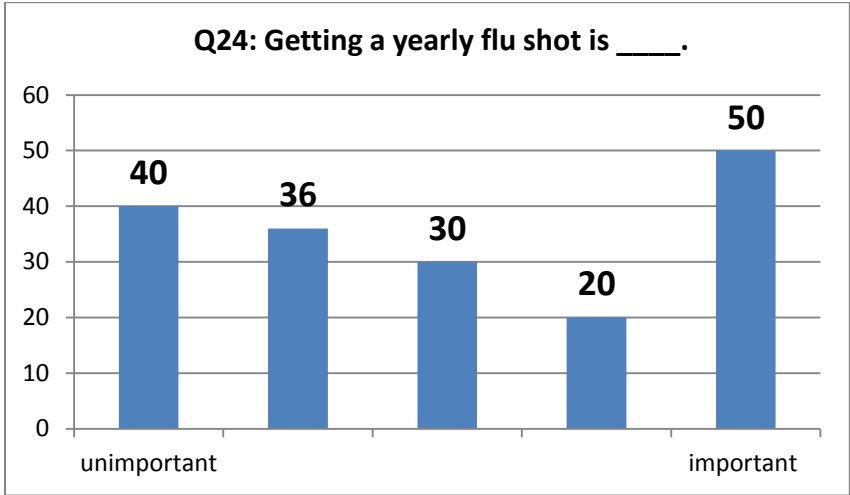
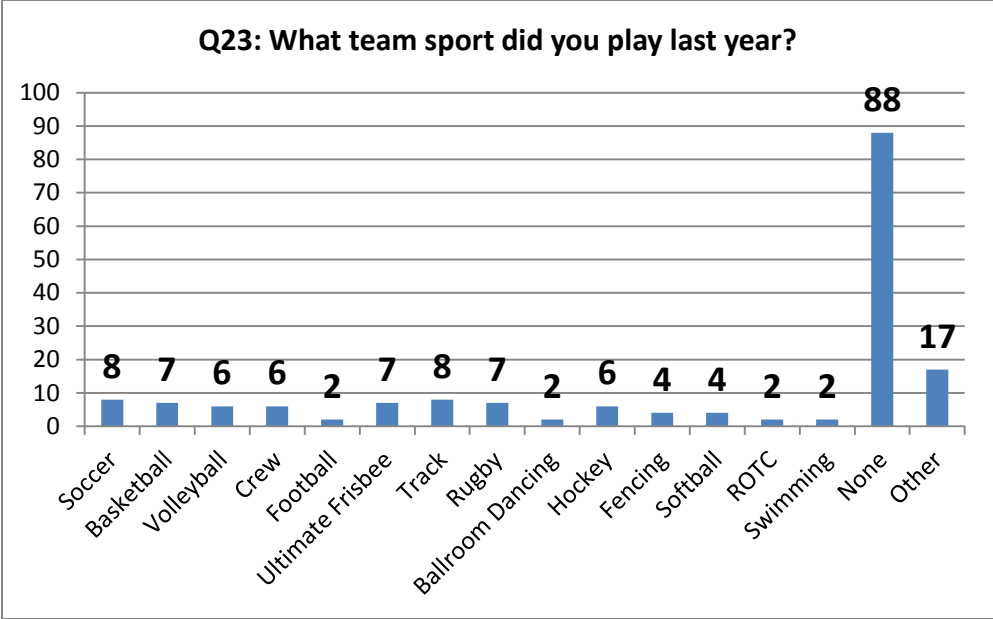


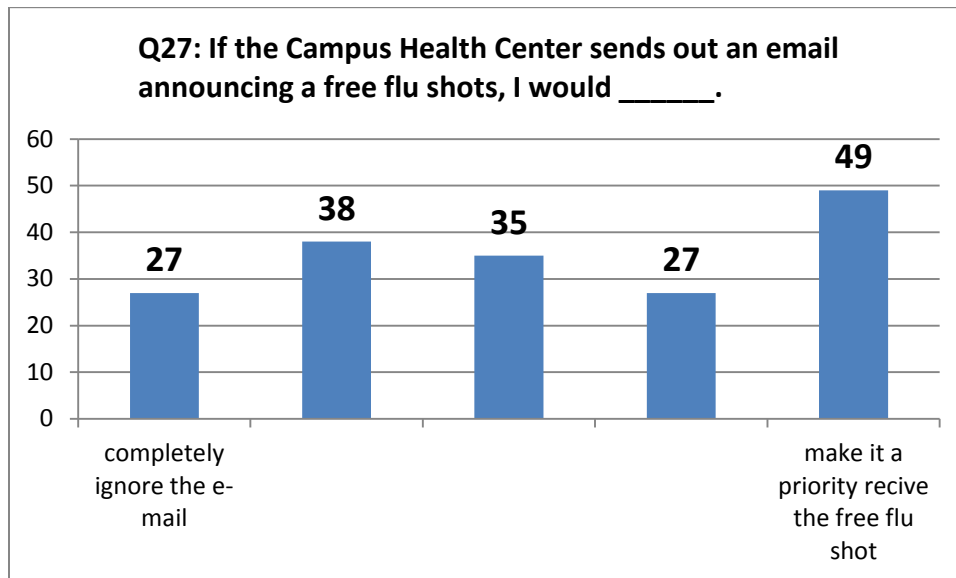
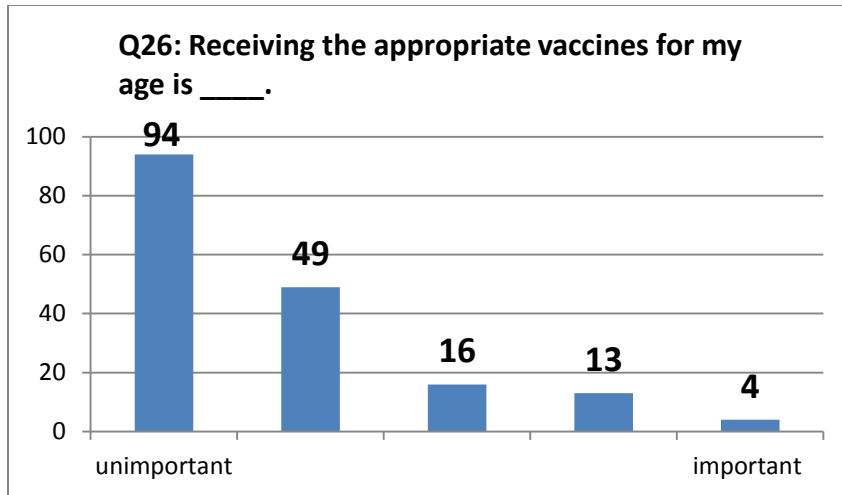


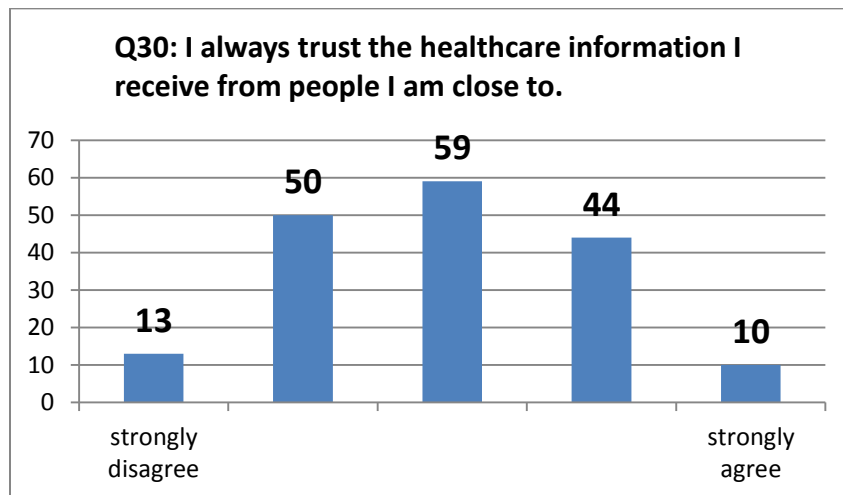
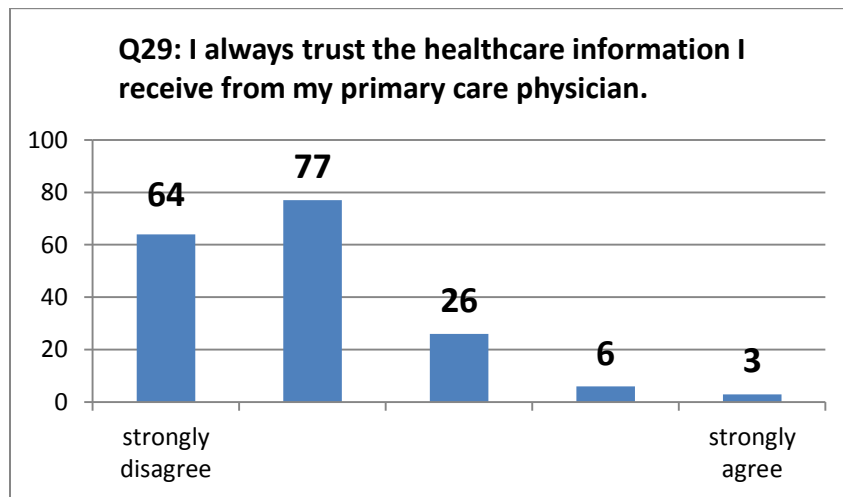
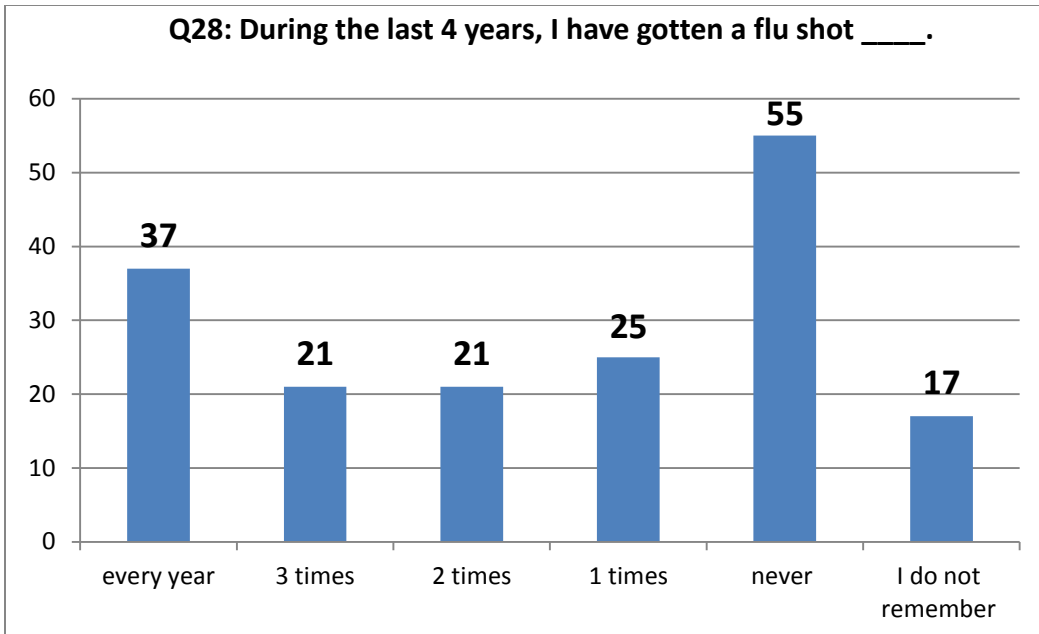




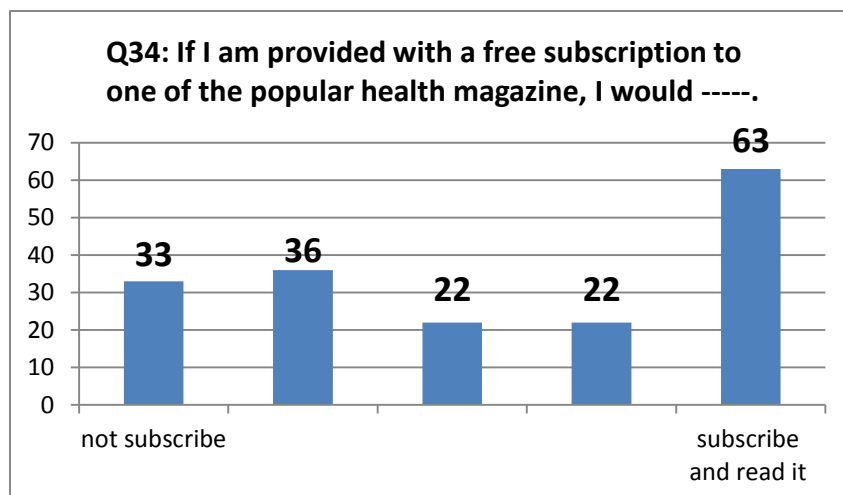
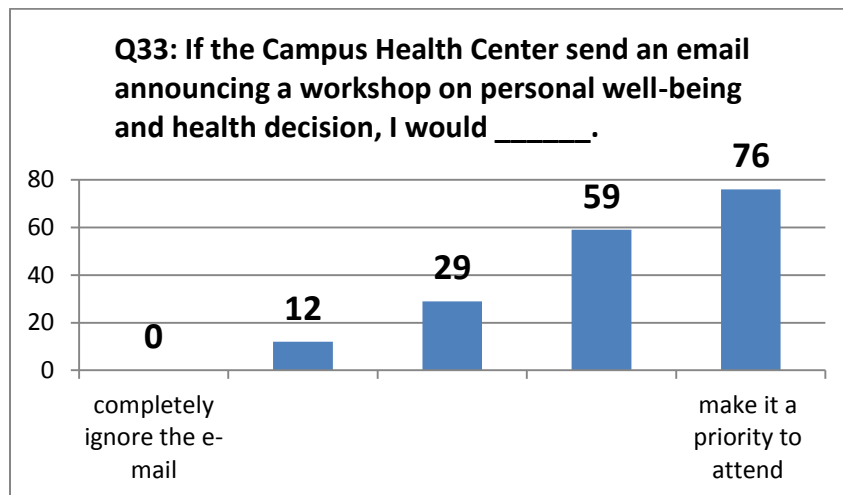
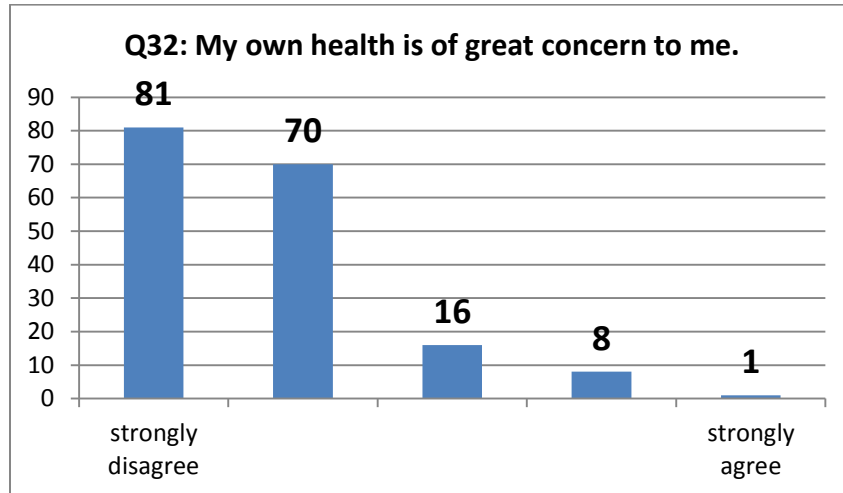






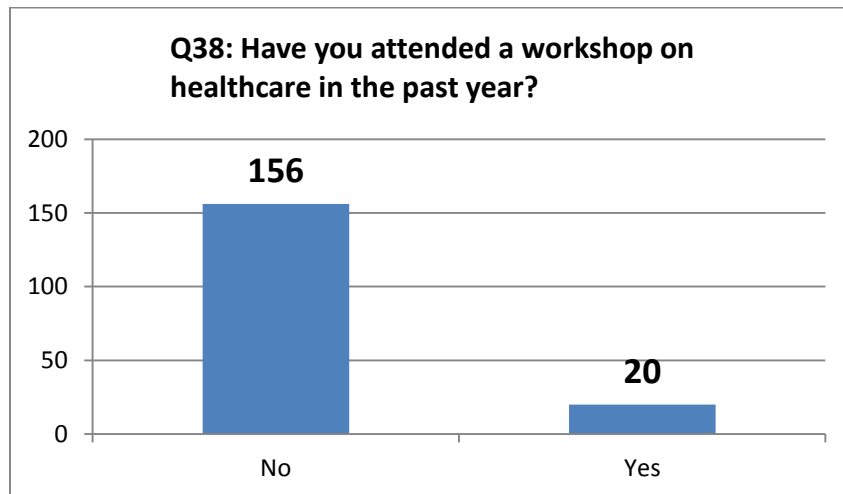
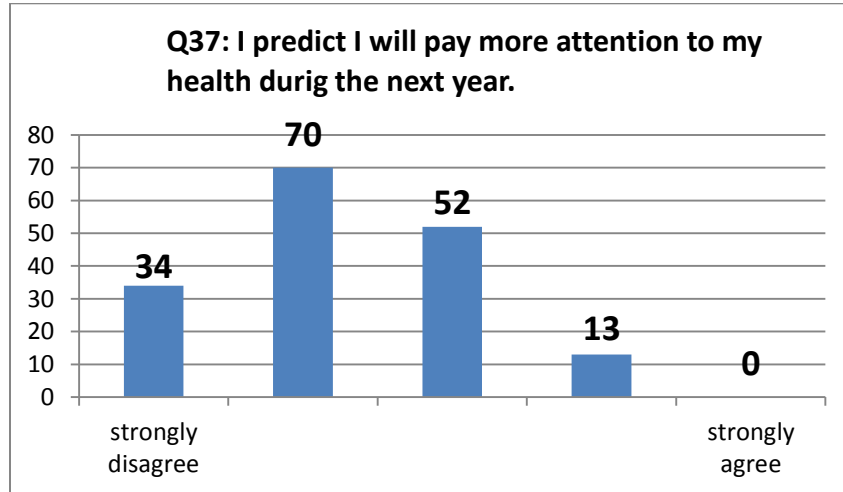


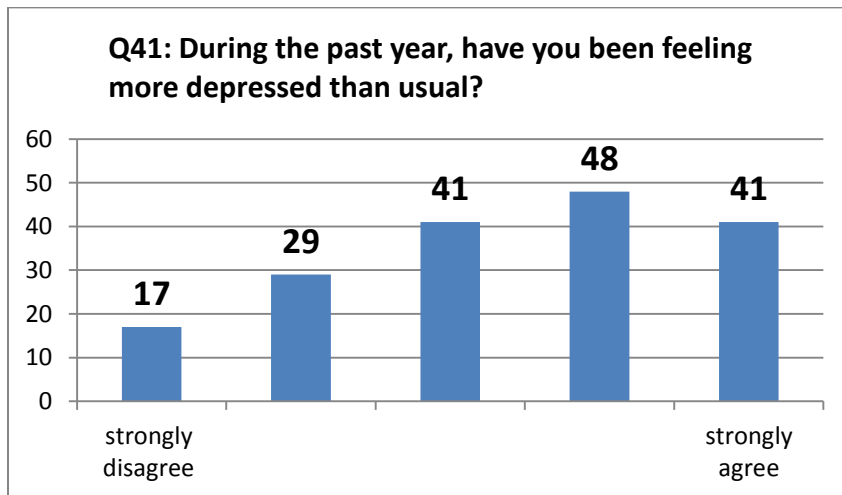
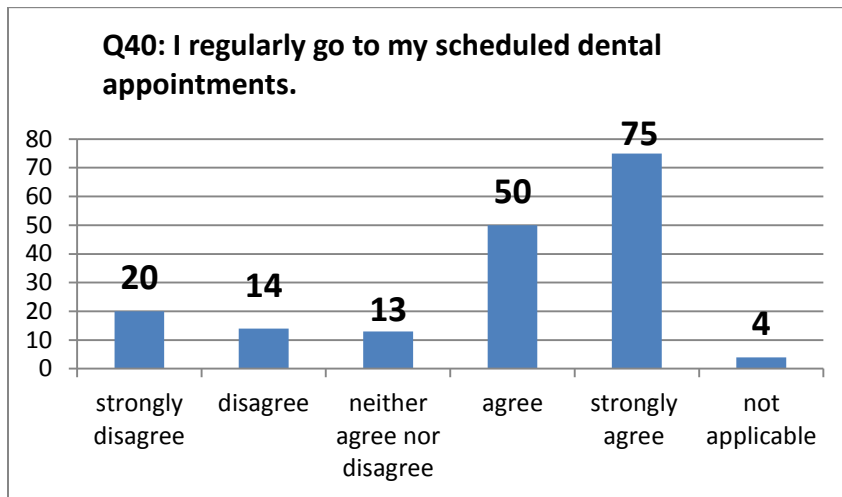
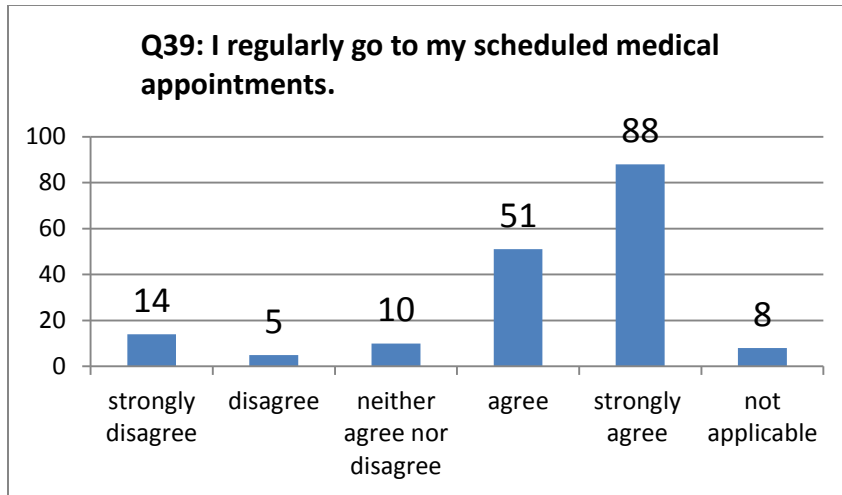
Q31: What aspects of your healthcare are most engaging to you?

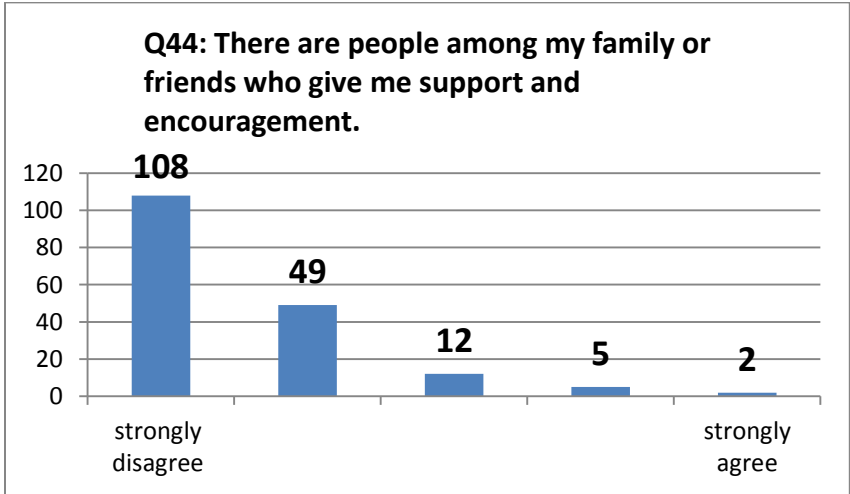
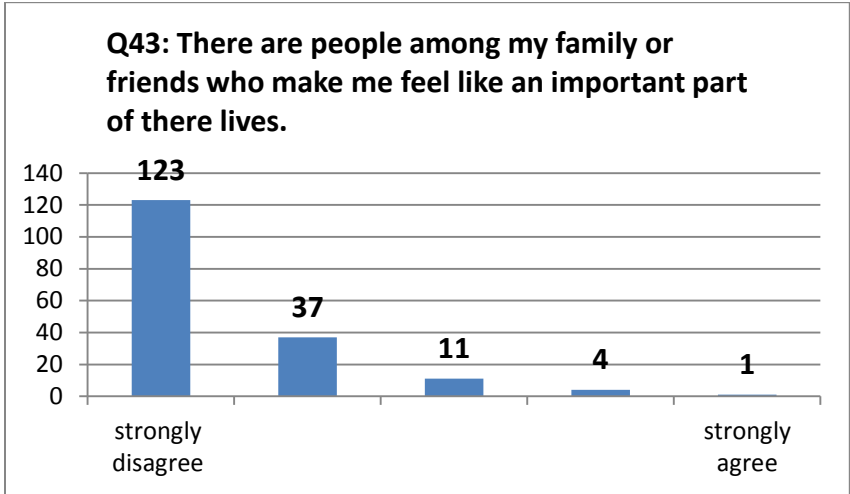
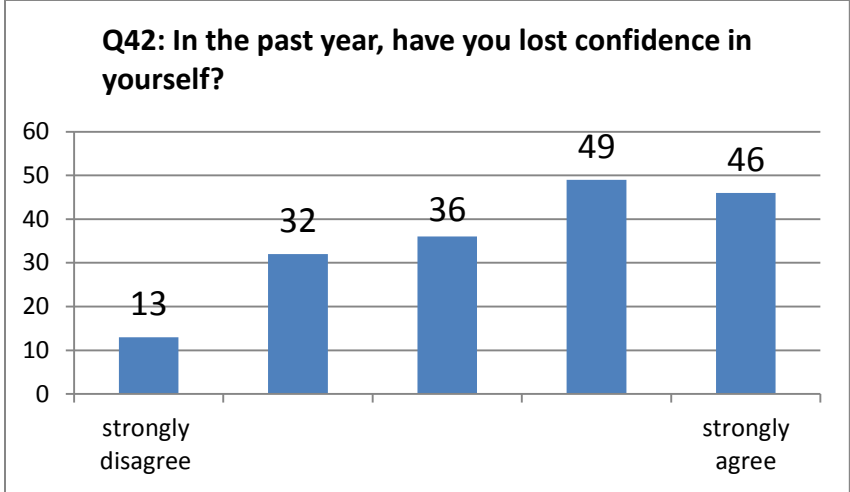


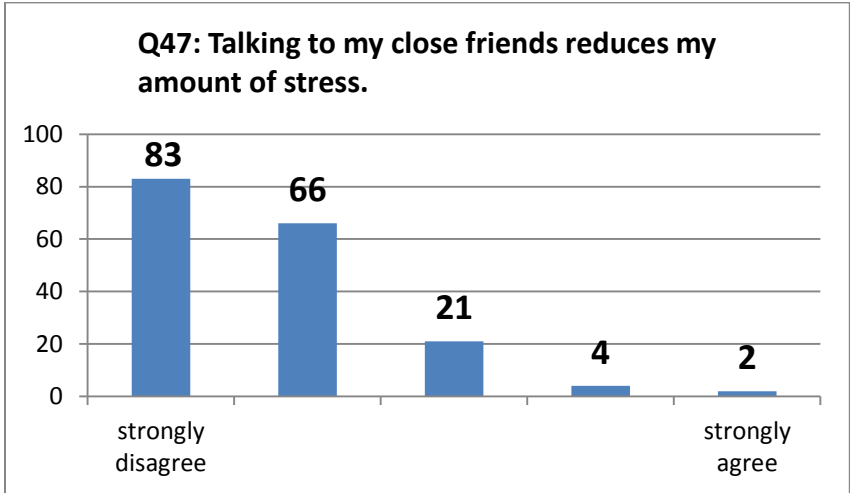
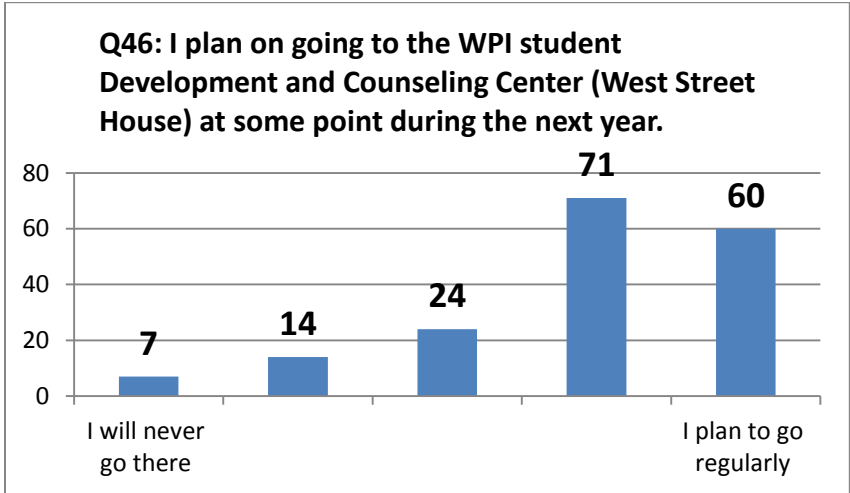
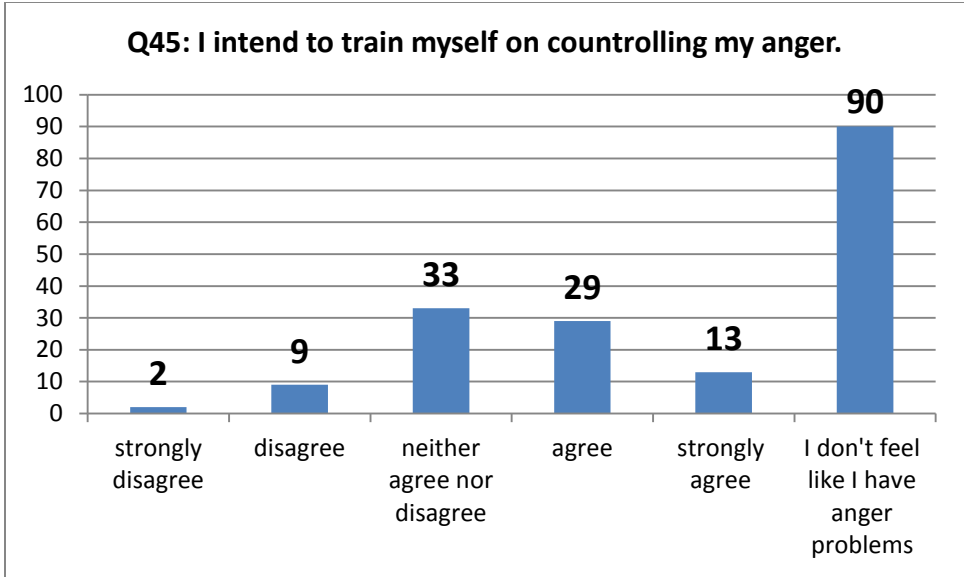
Q35: What aspects of your healthcare are most engaging to you?

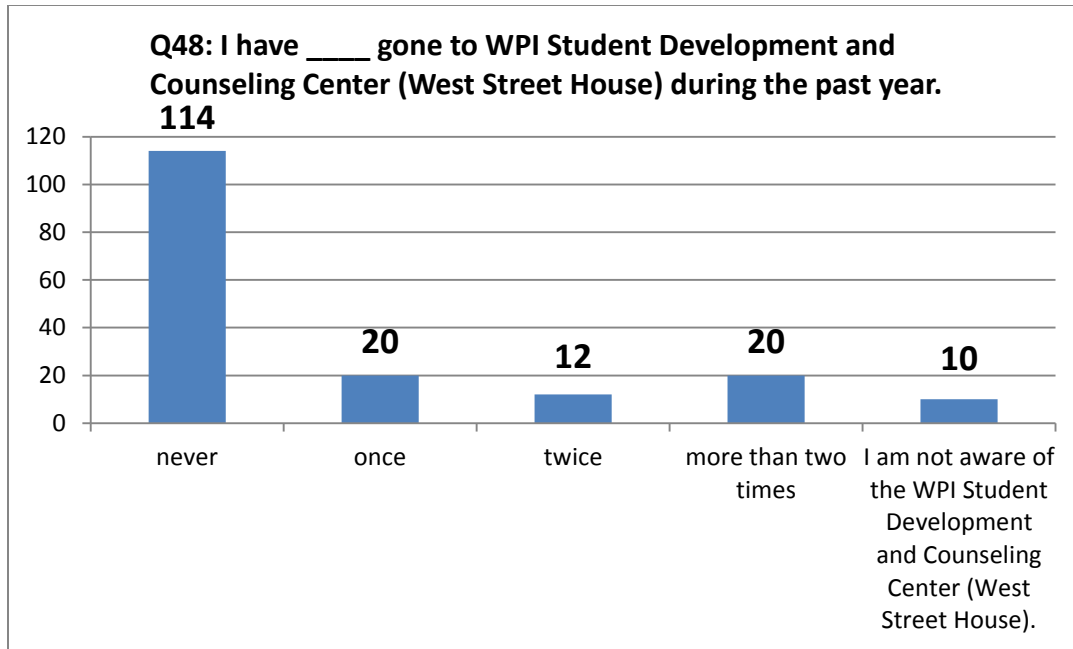
Q36: What specific actions are you planning to take in order to stay healthy during the current year?











Appendix C: Glossary

Healthcare engagement is defined as the “actions individuals must take to obtain the greatest benefit from the healthcare services available.” (Center for Advancing Health, 2010)

Cognitive engagement refers to the perceptions of young adults and how they feel about their own health. It is mainly affected by the knowledge aspect relating to personal health. Examples are perceptions based on experiences with family and friends. Knowledge is available through a variety of sources, such as magazines, workshops, primary care physicians, and the Web.

Behavioral engagement is about the plans and willingness that young adults have for themselves that are related to improving their personal health. As an example, this might be their intention to start exercising for half an hour each day, change their diet, and be more active in general

Health Behaviors is about the actions and steps that young adults take as result from their prior intentions. To illustrate, a college student will be actively going to the gym on a regular basis and filling out an Excel spreadsheet with his daily workout results.



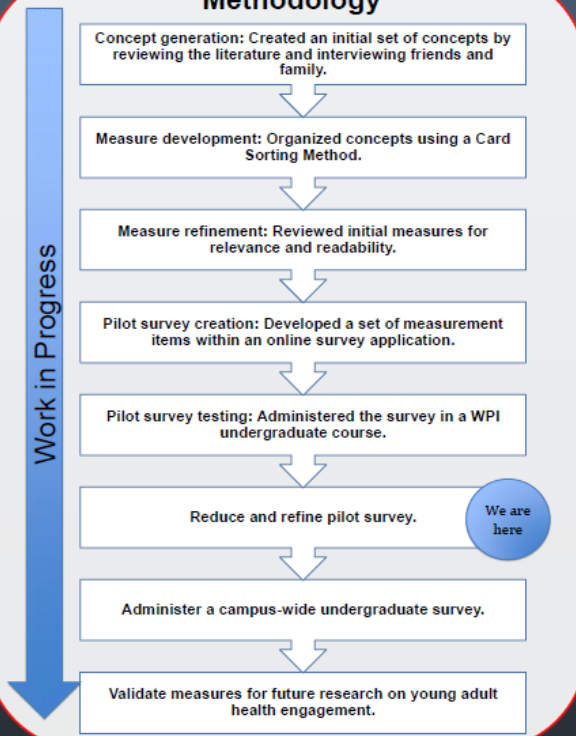
Young Adult Health Engagement

Mahmoud El-rifai (BME), Georgi Kardzhaliyski (MIS), Greg Viera (ME)
 Advisors: Professors Vance Wilson and Soussan Djamasbi (School of Business)

Abstract

There is a movement taking off calling for greater patient engagement which hopes to expand communication and understanding between providers and patients. In order to aid in this effort, we have begun testing a new Health Engagement Model by creating and administering an online survey. The model consists of three areas: Cognitive Engagement, Behavioral Engagement, and Health Behaviors. We are applying this model and survey to measure the Health Engagement of Young Adults age 18-25. Measurement items include diet, exercise, mental health, general health, vaccinations, and alcohol consumption.

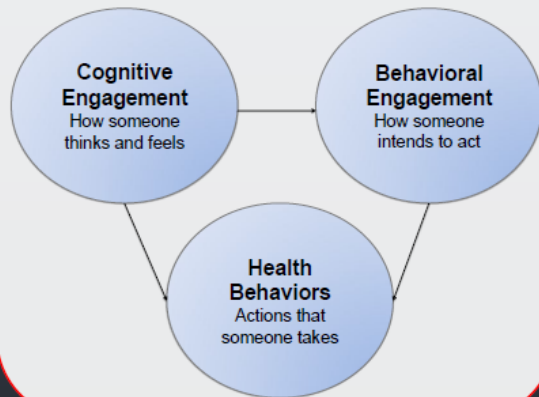
Methodology



Background

- Most prior health engagement research studies adults and is not theory-based.
- Studies of young adults focus on health issues (e.g., depression) rather than engagement.
- Young adults transition from parental control of health care to personal control.
- No measures currently exist that focus on health engagement in young adults.

Health Engagement Model



Appendix E: Concept Development - List of concepts

What aspects of healthcare are most important to young adults, especially aspects that distinguish young adults from children and from adults who head households?

1. Doctor appointment
2. Health decisions
 - a. Choosing PCP
 - b. Choosing dentist
 - c. Choosing physical therapist
 - d. Choosing health information online
 - e. Choosing a chiropractor
 - f. Choosing an optometrist
 - g. Choosing a surgeon
 - h. Choosing a nutritionist
3. Frequency of exercise
4. Location of exercise
 - a. Home / Garage / Basement
 - b. Gym
 - c. Health club
 - d. Group fitness
 - e. Public outdoor exercise facility
5. Sedentary lifestyle
6. Time spent watching TV
7. Time spent in front of the computer

8. Time spent playing games
9. Diet
10. Type of exercise
 - a. Walking (1+ miles)
 - b. Running / Jogging
 - c. Jump rope
 - d. Swimming
 - e. Weightlifting
 - f. Team sports
11. Alcoholism
12. Smoking
13. Eating fast food
14. Eating junk food
15. Eating nutritionally balanced food
16. Not eating enough food (Malnutrition)
17. Doctor Checkup appointment
18. Stress due to studying
19. Choosing health insurance
20. Physical therapy
21. Cardio
22. Time spent on studying
23. Counseling
24. Sleeping

25. Sleep-deprivation
26. Drug use
27. Safe sexual practices
28. STD Test
29. STI Test
30. Personal Hygiene
31. Walking
32. Daily vitamins / supplements
33. Water consumption
34. Liver function test
35. Sports activities
36. Family medical history
37. Soda
38. Dental hygiene
39. Parent
40. Sibling
41. Friend
42. Classmate
43. Relationship status
44. Employment status
45. Living conditions
46. Campus Health Center
47. Cold

48. Flu / Virus

49. Injury

- a. Sports injury
- b. Threat of being injured
- c. Physical injury
- d. Muscle soreness

50. Sports

51. Exams

52. WPI Projects

53. Transportation

54. Empathy

55. Pregnancy

56. Pain

57. 911

58. Allergies

59. Diabetes

60. Fever

61. Vaccination

62. Asthma

63. Back problems / injuries

64. Bone fractures

65. Anxiety

66. Personal safety

67. Suicide
68. Depression
69. Psychological Perception
70. Community
71. Off-campus Health Center / Emergency Room
72. Insurance claims
73. Health insurance policy knowledge
74. Sources of health information
 - a. Health center medical staff
 - b. Magazines
 - c. Television
 - d. Health educators
 - e. Leaflets
 - f. Doctors
 - g. Hospitals
 - h. Online sources
75. Finding source of health information
76. Online health search
77. Money
78. Homesickness
79. Psychological well-being
80. Cancer
81. Exposure to infections

Appendix F: List of constructs after Card Sorting Method

1. Health decisions
2. Medical habits
3. Exercise
4. Diet/nutrition
5. Community
6. Mental health
7. Health concerns
8. Health information/ sources
9. Daily Activities
10. Effects of school on health
11. Pathologies
12. Insurance
13. Demographics
14. Leisure time
15. Health education
16. Preventative medicine
17. Social interactions
18. Physical health