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The Perception of Technology on Continuous Health and Environmental Monitoring for Professional Drivers

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Environmental, Agricultural, and Occupational Health

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ABSTRACT

Due to the sedentary nature of professional truck driving (among other high-risk behaviors and hazardous exposures) many suffer from acute and chronic health conditions. There are many potential hazards in the professional driving profession. Many of these hazards come from those that transport hazardous materials. Figuring out what health and environmental indicators are important to measure can be a way to minimize hazards. Continuous health monitoring technology may be an option to detect disease and alert professional drivers when vital signs indicate impending health crises. Before this can be implemented, it will be important to evaluate the perception of wearable technology and if it is a feasible option for this population.

The purpose of this study is to look at such perceptions from professional drivers and to explore whether they would accept wearable technology that monitors their health and the surrounding environment. This project analyzed qualitative focus group data and quantitative survey data from professional drivers. Survey results showed, that respondents hauled hazardous material (67%). 187 or 86% of respondents said yes to using wearable technology. For comments from the 14% that do not use wearable technology, usefulness, interest, and understanding how to use the technology were the reasons why. A majority of the respondents were either extremely confident (52%) or very confident (29%) on their ability to operate wearable technology. Top 3 for % that said yes to types of health information were (Stability 85%, Heart rate 81%, and Hydration level 73%). Top 3 for % that said yes to types of environmental information were (oxygen, temperatures, and flammable gases). These results support that professional driver would potentially support the use of technology to monitor their health. There was no insight on costs, but multiple respondents commented usefulness as a problem.

INTRODUCTION

Professional Truck Driver's Occupational Hazards related to transporting hazardous materials:

There are many potential hazards in the professional driving profession. Many of these hazards come from those that transport hazardous materials. Figuring out what health and environmental indicators are important to find ways to minimize these hazards. To find out what indicators should be measured, it is important to ask professional drivers in the field to figure out what they think are some of the problems in their profession. While transporting hazardous material has its risks, there are multiple types and classifications that come with the profession.

Transporting hazardous materials is one of the many different types of goods that professional truck drivers transport. The Federal Motor Carrier Safety Administration (FMCSA) has classifications on different permits that allow drivers to transport different goods. Class A permits allow the combination of vehicles which has a gross combination weight rating or gross combination weight of 11,794 kilograms or more (26,001 pounds or more). Class B is any single vehicle which has a gross vehicle weight rating or gross vehicle weight of 11,794 or more kilograms (26,001 pounds or more). And Class C is any single vehicle, or combination of vehicles, that does not meet the definition of Class A or Class B but is transporting material that has been designated as hazardous under 49 U.S.C. 5103. HAZMAT drivers would be designated as Class C license classification by the FMCSA.

Transportation of hazardous materials can include single or bulk shipments of gasoline, poisonous shipments, explosive, or radioactive materials (Udin and Huynh 2018). A HAZMAT spill from a crash in a densely populated area can have great potential to cause significantly more casualties, injury, and damage to the environment and property than a typical commercial vehicle

crash (Craft 2004). Moreover, HAZMAT crashes can increase the risk of injuries due to fires that occur immediately after a crash as these vehicles could be transporting flammable substances (Udin and Huynh 2018). Another study looked at single and multi-vehicle crashes involving trucks on rural highways. They concluded that the probability of incapacitating or fatal injury experienced by truck drivers increases significantly (48.1% increase for single vehicles accidents and 49.1% increase for multi-vehicle accidents) if the truck carries HAZMAT materials (Chen and Chen 2011). There are many hazards and increased risks with professional truck drivers who transport HAZMAT materials

While HAZMAT hazards can be dangerous, there are also other hazards in the occupation. One study looked at 136 occupational injuries that were from truck drivers and they found that 63 cases came from falls and were the major cause of fractures (Shibuya et al. 2010). Fatigue can also be an issue for driver alertness and performance. Short sleep durations have been associated with motor vehicle accidents (Cori et al. 2021). These are some of the many acute problems that professional truck drivers must deal with. Designing solutions on lessening the number of slips, trips, and falls as well as maintaining driver alertness are very important.

There are also chronic health concerns in this occupation. A study looking at the difference in short and long-haul drivers proportionate mortality for lung cancer, ischemic heart disease, and myocardial heart infarction. They found that the highest significant excess proportionate mortality was found for long-haul truck drivers who were under the age of 55 at death. The study also found that the highest significantly elevated proportionate heart disease (IHD, acute myocardial infarction (AMI), and other forms of heart disease) and lung cancer mortality was found for White and Black male long haul truck drivers age 15–54. (Robinson & Burnett 2005). Another study looked at the health demographics in a certain region and found

that only one-quarter of the sample of over 12,000 professional truck drivers had no health conditions. In contrast, more than half were obese, one-third had back problems, and one/sixth had a high risk of cardiovascular disease (Tremblay et al. 2020). Compared to overall US Drivers, truck drivers had significantly higher body mass index, and higher current cigarette use. Their physical activity was also low and 25% had never had their cholesterol levels tested (Birdsey et al. 2015). Professional truck drivers are plagued with numerous health threats that can range from short-term to long-term health effects. Monitoring their health is very important as well as awareness of the risks so that these health effects can be minimized.

Importance of Wearable Technology

Wearable technology can provide real-time feedback on one's health information and alert the driver if there are any impending acute life-threatening conditions (Binkley et al. 2003). Wearable technology can either intermittently or continuously monitor and record relevant physiologic signals and offer solutions that are limited by traditional insights and monitoring schemes used currently (Binkley et al. 2003). Professional truck drivers can also have problems such as ischemic heart disease and myocardial heart infarction. Wearable technology can monitor a person's heart signals such as arrhythmias which can be an indicator of heart disease (Binkley et al. 2003). This is true for other measurements such as blood pressure, heart rate, respiratory rate, and blood oxygen saturation levels that can provide insight into the health of the person (Binkley et al. 2003).

Another possible use of wearable technology is for environmental monitoring of professional truck drivers. Measuring the environment is very important as many exposures within the environment can lead to diseases. One study found a causal relationship between

exposure to particulate matter air pollution and cardiovascular morbidity and mortality (Brook et al. 2010). Environmental noise can also be a factor in this occupation. Environmental noise is very important to monitor as the Occupational Safety and Health Administration (OSHA) warns that high levels of noise can cause permanent hearing loss and loud noise can create physical and psychological stress, reduce productivity, and interfere with communication and concentration which are all important factors in this occupation.

Wearable technology must be easy to use for the wearer. One study examined patient preferences for where the wearable technology should be placed on the body. It was found that sensor systems need to be small, discreet, unobtrusive, and incorporated into everyday objects. The upper extremity was also preferred as the favored position for the body (Bergmann et al. 2012). Studies have also shown that while drivers are aware of their unhealthy lifestyle and would like to change it, they have concerns regarding being continuously monitored by their employers. These concerns include who will have access to the data collected and if the data collected could risk their jobs with their employers (Greenfield et al. 2016). These are important factors when figuring out what kinds of wearable technology that truck drivers would wear as it is hypothesized that professional truck drivers would have preferences where the sensor systems are easy to use and monitored discretely so that their job would not be at risk.

The purpose of this study is to determine if the perceptions of professional drivers in the survey will support the use of wearable technology in the field. It is hypothesized that the drivers will support the use of wearable technology, but the technology used must be easy to use, does not deter from the workplace environment as the sensors cannot be interfering with the driver's work, and has a fair cost such that employers would be willing to spend money on the technology. This study is part of a larger project that involves developing an emergency

monitoring system for transportation workers and first responders that are exposed to environmental exposures associated with hazardous material. The REaCH (Real-Time Emergency Communication System for HazMat Incidents) system was created for this reason so that real-time monitoring of transportation workers and first responders through wearable devices capture individual health parameters and environmental exposures. Before this can be done, there needs to be more information about what health parameters and sensors that can be used.

SPECIFIC AIMS

Aim 1: Evaluate the perception of wearable technology in professional drivers.

Hypothesis: Professional drivers would support the use of technology to monitor their health

Aim 2: Identify the barriers of use for professional drivers using wearable technology.

Hypothesis: Costs and practical uses are a barrier for use.

Aim 3: Identify health indicators that professional drivers would want monitored

Hypothesis: Top 3 health indicators would be heart rate, blood pressure, and blood oxygen levels

Aim 4: Identify environmental indicators that professional drivers would want monitored

Hypothesis: Top 3 environmental indicators would be oxygen, temperature, and carbon monoxide.

METHODS

Survey Preparation

Before survey was dispersed, 3 experts in the field reviewed the survey to ensure the questions were straightforward, and the terminology was correct for those in the trucking industry. These

included a HAZMAT expert from local state patrol, a Safety Manager for a HAZMAT trucking company, and a Commercial Driver's License (CDL) Truck Driver Instructor.

A similar survey was sent to first responders regarding their perception of wearable technology. The first responder study was completed at a local area fire department with no inclusion/exclusion criteria for the study. Similar questions were asked as well as if the first responders worked in special operations (Grothe et al., 2022). As for the professional driver survey, similar questions were asked such as demographics and perception of wearable technology. Each respondent was also asked if they haul hazardous material. The survey also included questions regarding the types of health information that professional drivers would like to have monitored such as heart rate, blood pressure, core body temperature, skin temperature, hydration level, stability, falls, breathing rate, breathing depth, blood oxygen levels, etc. Environmental information was also collected. Types of environmental information that will be collected from professional drivers to be monitored includes oxygen, carbon monoxide, flammable gases, non-flammable gases, carbon dioxide, infectious substances, radiation, poison, explosives, temperature, humidity, noise, pressure, and air quality.

Survey Data Collection and Analysis

The survey responses were collected electronically through Microsoft Forms. The survey was distributed by sending a link to the from through emails from multiple sources. Multiple companies from locations across the United States were contacted. For example, the project was discussed with the Safety Manager at Sapp Bros of Omaha. Then the safety manager sent the online survey to all the company's locations. Additional local companies such as Frontier Cooperative, Nebraska-Iowa Supply company, and others were contacted via telephone and email. However, the survey companies decided not to send out the surveys. Nationwide

companies such as Hazmat Inc. were contacted, and we were able to discuss the project and review the survey. The survey was not sent out by this this company. Not only were trucking companies contacted, but organizations such as Nebraska Trucking Association, HAZMAT State patrol, and the local Metro Community College were also included in the potential sender list. Again, discussion was held either via telephone or email. While some of these responded to our requests, there were many that did not. From this strategy, there were 6 total responses to the survey. Because the response rate to the request for assistance from companies was low, other avenues of reaching out to professional drivers were explored. There are many professional truck drivers on social media as well as trucking groups. For this reason, a Facebook ad was placed; $99.97 was spent over 5 days and reached 8,728 people. Facebook reported that there were 93 clicks on the ad. The URL tracker reported that around 188 clicked on the link. From this, there were only 6 survey responses. People were clicking the links the first time, but many did not complete survey. Due to the lack of responses, another Facebook ad was placed with incentives.

In the new Facebook Ads, a $10 dollar incentive was placed for valid responses that submitted address and name. In this round, there were 74 link clicks on the ad. $34.78 was spent over 3 days and reached 2,958 people.. With the included incentive, there were 210 responses for this round of Facebook ads. In total, there were 222 respondents and 218 were used for analysis. Four were removed for being invalid or incomplete Descriptive statistics were collected from the survey with tables and graphs. Attached below is a link to the Microsoft Forms link and the survey can be viewed.

https://forms.office.com/r/0uiuX0V9cG

RESULTS

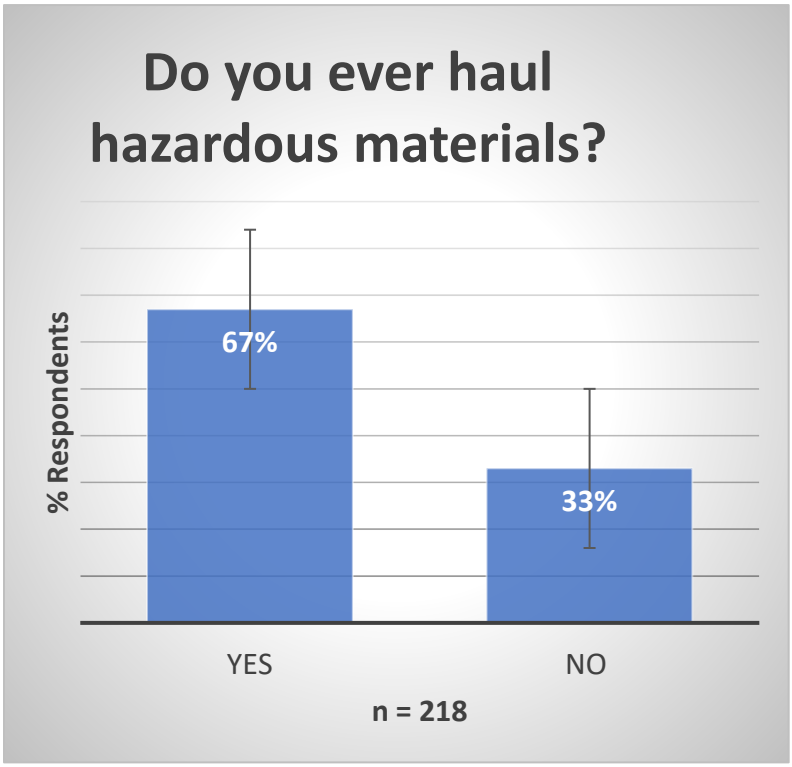
Table 1: Age of Survey Respondents

Age	Survey Respondents
18-20	**0**
20-29	**139**
30-39	**58**
40-49	**17**
50-59	**1**
60-69	**3**

There was a total of 222 responses. Four responses were deleted due to invalid responses. Invalid responses included those that did not respond in ways that related to the survey. The average age of respondents was 30 +/- 7 years For those that haul any hazardous material, 67% said yes and 33% said no. Length of service was not asked on the survey. Survey respondents were all U.S based but not restricted by zip code.

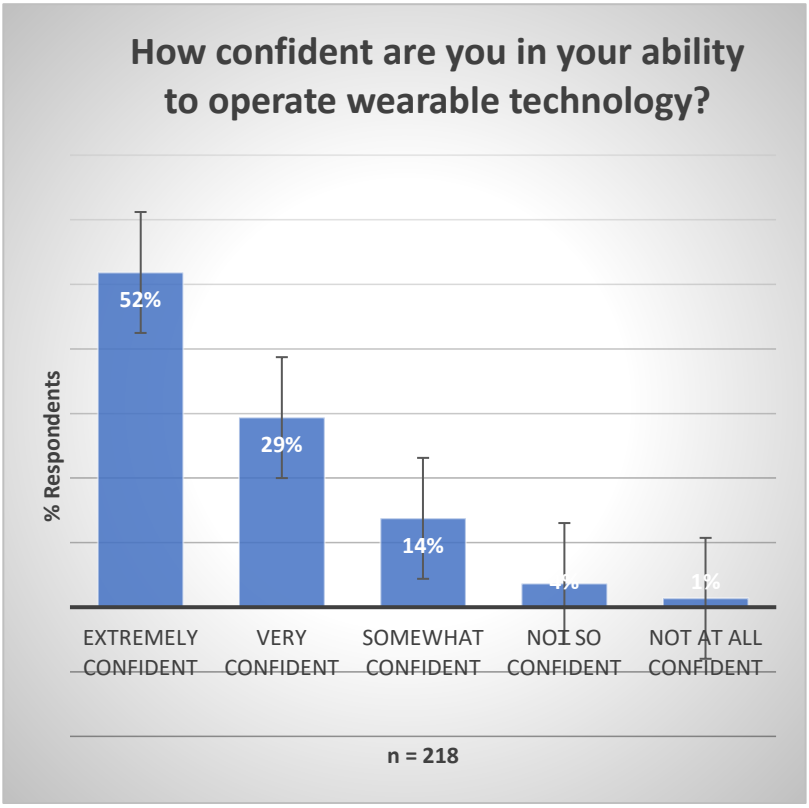
There were 187, or 86%, of respondents who supported the use wearable technology on the job. For the 14% who said no to using wearable technology, comments on why they felt this way included: not useful, not interested, or don't understand wearable technology well enough to use. As seen in Table 1, There were 0 respondents from the 18-20 age range. Most of the survey respondents came from either the 20-29 and 30-39 age range at 139 and 58 respondents respectively. There were 17 respondents at the 49-49 age range and 1 and 3 respondents for 50-59 and 60-69 age range.

Figure 1: % Respondents who responded yes or no to hauling any hazardous materials



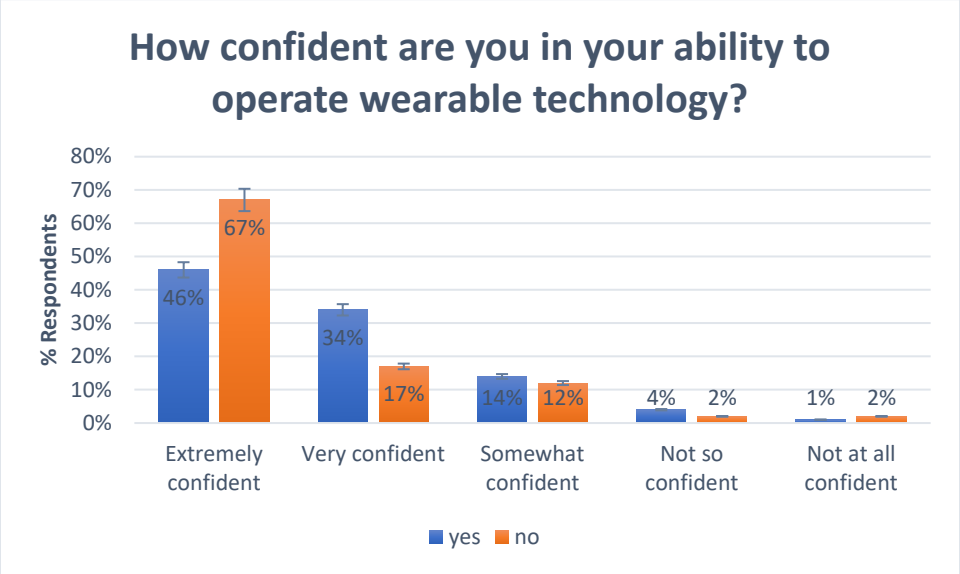
Respondents were asked if they ever haul any hazardous material (Figure 1). From these responses, 67% responded yes while 33% responded no. Survey analysis was also separated by if they haul hazardous material or not. Analysis with this separation included confidence in ability to operate wearable technology as well as health and environmental indicators.

Figure 2: % Respondents' confidence in ability to operate wearable technology



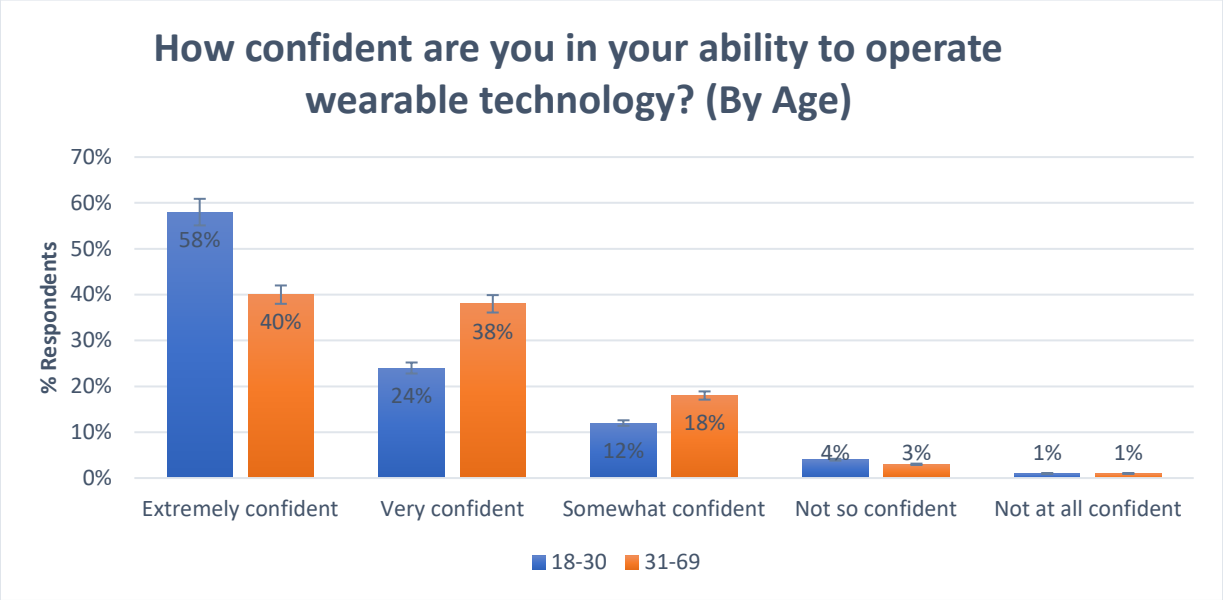
From Figure 2, 52% of respondents were extremely confident in their ability to operate wearable technology, 29% were very confident, 14% were somewhat confident, 4% were not so confident, and 1% were not a confident in operating wearable technology.

Figure 3: % Respondents' confidence in ability to operate wearable technology (Separated by if they said yes or no to hauling hazardous materials)



When the data was separated by those that haul hazardous material and those who do not (figure 3), the 33% who said no to hauling any hazardous material had 67% that were extremely confident in their ability to operate wearable technology and 17% that were very confident. The other 16% were either somewhat confident, not so confident, or not at all confident. From those who said yes to hauling hazardous material, 46% said they were extremely confident in their ability to operate wearable technology and 34% said they were very confident. The other 19% were either somewhat confident, not so confident, or not at all confident. Further, those who said no in using wearable technology, the majority of respondents said they were either extremely confident, very confident, or somewhat confident in their ability to operate wearable technology.

Figure 4: % Respondents' confidence in ability to operate wearable technology (by age)



Confidence ability to operate wearable technology was also analyzed by age. As the average age of survey respondents was 30 years old, the data was separated by 18 -30 years old and 31- 69 years old (Figure 4). Most respondents for both age groups choose extremely confident or very confident. The 18-30 age range had most of their respondents choose extremely confident at 58% and the 31–69 age group had most of their respondents choose the same as well at 40%. The 18-30 age range had 24% choose very confident while the 31-69 age group had 38% choose this. As for somewhat confident, the 18-30 age range had 12% responses and the 31-69 age range had 18% of respondents choose this. The 18-30 age range had 4% respondents choose not so confident while the 31-69 age range had 3%. Lastly, both age groups also had the least number of responses for not at all confident with both at 1%.

Figure 5: % Respondents responded yes to types of health information that would be useful (HAZMAT vs. Non-HAZMAT)

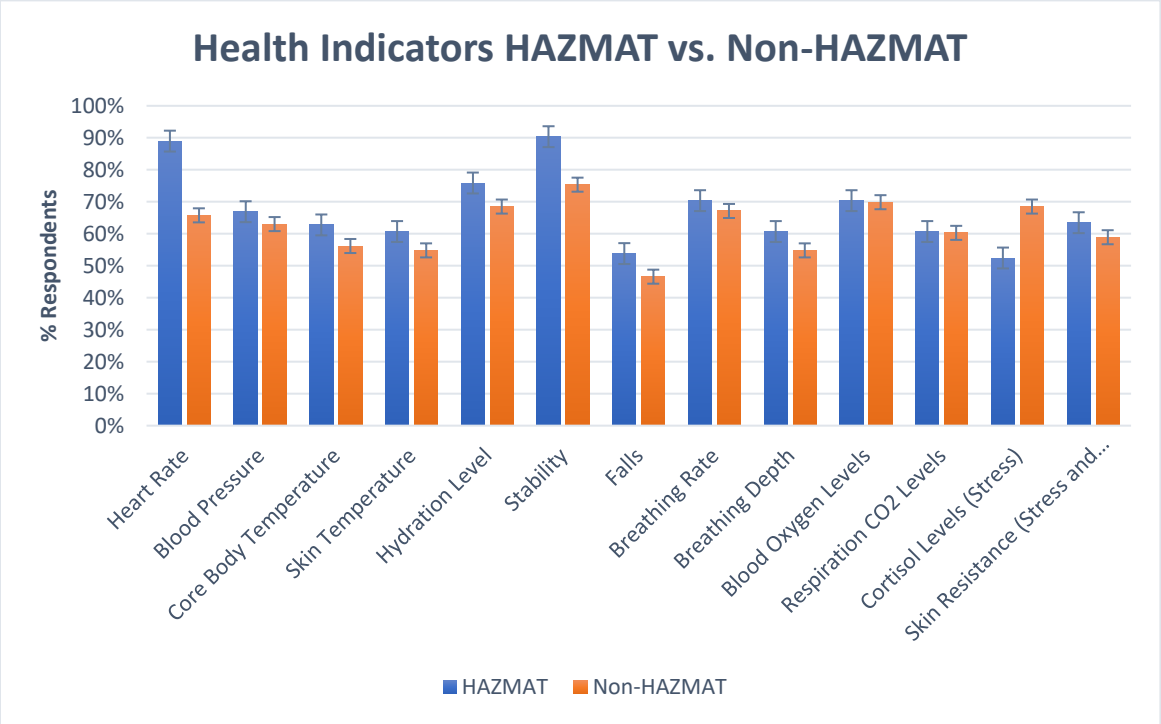
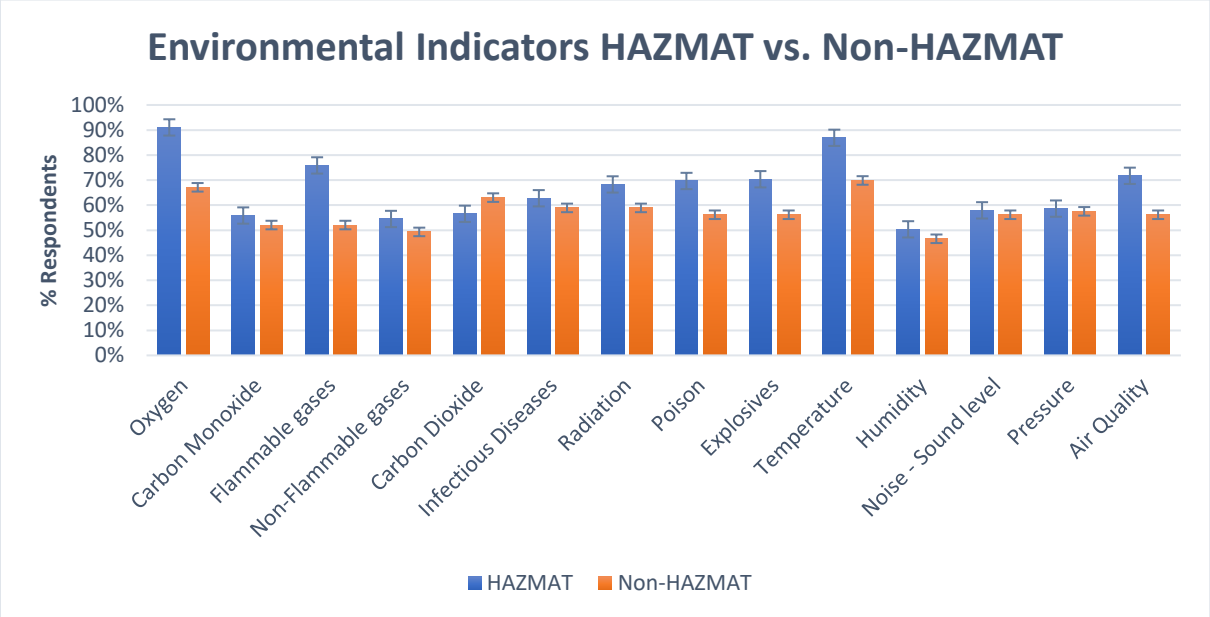


Figure 6: % Respondents responded yes to types of environmental information that would be useful (HAZMAT vs non-HAZMAT)



The top 3 items for those who said yes to including types of health information were stability, heart rate, and hydration level respectively. The bottom 3 items were falls, and cortisol levels, while breathing depth and skin temperatures were tied. Data was also separated by HAZMAT vs. Non-HAZMAT. For HAZMAT (Figure 5), the top 3 responses were similar to the overall responses. The top 3 were stability, heart rate and hydration levels. The bottom three were cortisol levels, falls, and breathing depth. As for Non-HAZMAT, the top 3 was a little different with stability, blood oxygen levels, and breathing rate. The bottom three were falls, skin temperature, and core body temperature.

The overall top 3 results for those who said yes to types of environmental information they would like monitored include oxygen, temperature, and flammable gases (Figure 6). The bottom 3 responses were humidity, carbon monoxide, and non-flammable gases. Environmental data was also separated by HAZMAT vs. Non-HAZMAT. For HAZMAT, the top three environmental indicators were oxygen, temperature, and flammable gases. This was similar to the top 3 overall environmental indicators. The bottom 3 environmental indicators were humidity, carbon monoxide, and non- flammable gases. As for Non-HAZMAT, the tope 3 environmental indicators were temperature, oxygen, and carbon dioxide.

Figure 7: % Respondents on preference on who to monitor their health

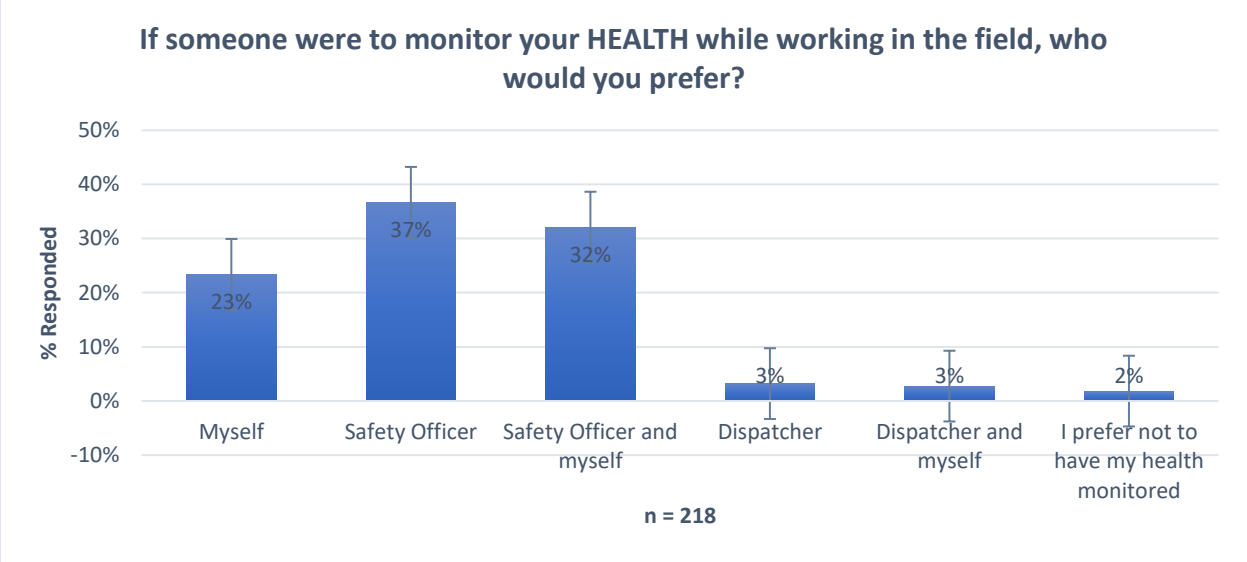
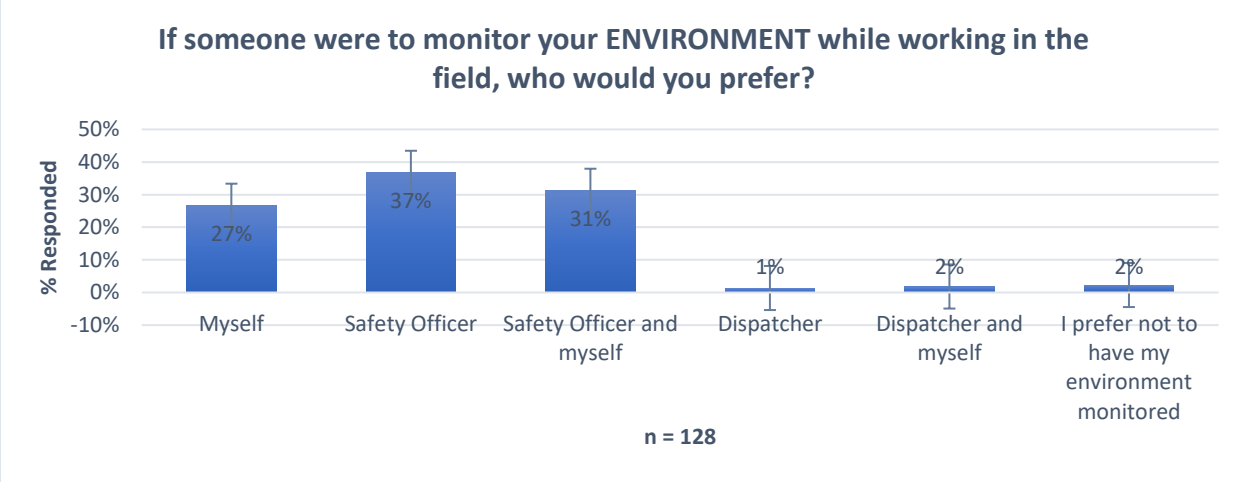


Figure 8: % Respondents on preference on who to monitor their environment



As for respondents' answers on preference for who to monitor their health (Figure 7), the top answers were Safety Officer at 37%, Safety Officer and myself at 32%, and Myself at 23%. The bottom choices were, "I prefer not to have my health monitored", Dispatcher, and Dispatcher and myself. Results were very similar regarding respondents' preferences on who would monitor their environment (Figure 8).

DISCUSSION/CONCLUSION

As professional drivers have many hazards in the occupation, it is important to figure out what health and environmental indicators need to be measured so that these hazards can be minimized. To do this, finding out firsthand from professional drivers on their thoughts and comments can be a helpful way figure out what indicators need to be focused on. These indicators can then measured in the REaCH system that was created for real-time monitoring of transportation workers and first responders through wearable devices. When comparing confidence in wearable technology for those that haul and do not haul hazardous material, the respondents that said no, 67% were extremely confident in their ability to operate wearable technology and 17% were very confident. The other 16% were either somewhat confident, not so confident, or not at all confident. From those who said yes to hauling hazardous material, 46% said they were extremely confident in their ability to operate wearable technology and 34% said they were very confident. The other 19% were either somewhat confident, not so confident, or not at all confident. Those that haul hazardous materials had less respondents that were extremely confident but had more respondents that reported that they were very confident in their ability to operate wearable technology. Percentages for each section was similar in those that haul and don't haul hazardous materials. This can be expected as confidence in ability to operate wearable technology is suggested to not be specific in those who transport hazardous materials and those who do not. This could be because professional drivers must have some sort of background in using technology and the specific field does not matter.

Confidence in their inability to operate wearable technology was also analyzed by age. Most respondents for both age groups choose extremely confident or very confident. Both age groups also had the least number of responses for not at all confident with both at 1%. In all, confidence was similar in the two age groups. This was surprising information as there was an

expected difference in age. It is inferred that the older population would be less confident in their ability to wearable technology but most respondents in the older age group responded otherwise.

Health and Environmental Indicators

When looking at survey results for health and environmental indicators, Top 3 for % that said yes to types of health information were stability, heart rate, and hydration level. When separated by HAZMAT vs. Non-HAZMAT, For HAZMAT (Figure 5), the top 3 responses were similar to the overall responses. The top 3 were stability, heart rate and hydration levels. The bottom three were cortisol levels, falls, and breathing depth. As for Non-HAZMAT, the top 3 was a little different with stability, blood oxygen levels, and breathing rate. The bottom three were falls, skin temperature, and core body temperature. While there are no comments on why they chose the top 3, it was previously mentioned that truck drivers have a higher risk and more susceptible of cardiovascular disease (Tremblay et al. 2020). This could have been a reason why heart rate was chosen. Stability and hydration levels could have been chosen because the need for stability to transport and haul the hazardous material and the need to keep hydration levels adequate as transporting materials can be a strenuous job. As for Non-HAZMAT responses, it was interesting that blood oxygen levels and breathing rate were in the top 3. Both relate to each other and are important indicators when transporting materials. Exactly why they are chosen would need to be further investigated but the job can be strenuous and the intake of oxygen in the body is important for a physically demanding job.

As for environmental indicators, the Top 3 for % that said yes to types of environmental information were oxygen, temperature, and flammable gases. Also mentioned in the introduction, HAZMAT crashes can increase the risk of injuries due to fires from vehicles that

are transporting flammable substances (Udin and Huynh, 2018). With the risks of transporting these substances, there would be a need to monitor this environmental indicator. When separated by HAZMAT vs. Non-HAZMAT. For HAZMAT, the top three environmental indicators were oxygen, temperature, and flammable gases. This was similar to the top 3 overall environmental indicators. The bottom 3 environmental indicators were humidity, carbon monoxide, and non-flammable gases. As for Non-HAZMAT, the top 3 environmental indicators were temperature, oxygen, and carbon dioxide. The Non-HAZMAT choices were also very interesting as the difference between the top 3 choices and the top 3 choices for HAZMAT was carbon dioxide instead of flammable gases. Since HAZMAT would transport flammable chemicals, this would make sense that it is chosen more. As for carbon dioxide in the top 3, that was surprising as carbon monoxide has been a bigger problem in past trucking incidents. Looking into carbon dioxide and why it was chosen would need to be investigated further.

These results support Aim 1 and our hypothesis that professional drivers would support the use of technology to monitor their health. As for Aim 2, those who responded no to using wearable technology, commented it was the lack of usefulness that deterred them for using wearable technology. This supported our hypothesis that practical use is a barrier. Aim 3 and our hypothesis was partially correct as heart rate was predicted. Blood pressure and blood oxygen levels were not in the top 3 overall and it was surprising that stability and hydration levels were chosen over blood pressure as it is a current problem in professional drivers (Trembley et al. 2020). Aim 4 and the hypothesis was also partially correct as oxygen, temperature, and carbon monoxide was predicted. The respondents chose flammable gases instead of carbon monoxide. While flammable gases are an important environmental indicator to measure, carbon monoxide is just as important as it is a big problem in not only professional drivers, but other professions.

When comparing the data to a similar study completed with first responders, the first responder study found that there was a need for health and environmental monitoring. Most of the respondents of that study preferred to have the health indicators monitored by SEMS (Safety and Environmental Management systems) operator and themselves. The professional driver survey did not have a SEMS operator as an option and was replaced with Safety Officer. When compared, 63.1% of first responders chose SEMS operator and 32% of professional drivers chose safety officer to monitor their health. The health indicator chosen to be most important in the first responder study was heart rate at 98.2%. Heart rate was the second highest for the professional driver survey at 81%. Comments made by first responders for current wearable technology included that it was not a viable option as devices were too expensive and not durable. The professional driver survey had no comments regarding costs.

This study was able to successfully look at all four aims and compare results with the hypothesis. One of the biggest reasons for this study was to investigate the perception of wearable technology in professional drivers and to see if integrating this technology can be feasible. Our results suggests that professional drivers would support the use of wearable technology in the workplace setting and that they were confident in doing so. Some of the barriers include awareness of the use of wearable technology and if it can be useful. These concerns must be addressed before trying to integrate into their professional lives. The study also found health and environmental indicators that were deemed important by professional drivers on the field. This information can be very useful to know what types of sensors need to be found and integrated into the dashboard system that is part of the larger project of this study.

Limitations

There were many challenges with collecting the data. Many of the companies that were contacted either did not respond or declined to do a focus group/survey. The COVID-19 pandemic may have played a negative factor as companies could have been hesitant to do in person focus groups or to allow people outside of the company to ask any health-related questions. With the many health problems and shortages that resulted from COVID-19, it is possible that companies prefer to keep their employees' health information private. Due to the barriers of this strategy, Facebook ads were then implemented. Social media includes many different groups of people including professional truck drivers. The online survey was directed towards this group. There may have been sufficient data in gathering responses through Facebook, but it also came with its limitations. It could not be verified whether the respondents were all true, professional truck drivers. The Facebook ads targeted professional truck drivers' however, anyone could respond to the survey. This also could have affected the average age of participants in the study (30 +/- 7). This could be because younger individuals tend to use Facebook. According to Statista, the age range of active Facebook users are in the 18-34 age range. This mirrors the age ranges where most survey responses fell. When comparing the average age or survey respondents to the average age of truck driver, a 2019 report from the American Trucking Associations reported that the average age of over-the-road driver is 46 years old. In addition, they reported that the average age of new truck drivers is 35 years old (Costello & Karickhoff, 2019). Our survey respondents are younger than both the mean of over-the road drivers and incoming age of new truck drivers. Therefore, survey results could have been different with an older age group.

Future Directions

When looking at future directions, a focus group to help dive deep into insights on perceptions of wearable technology, as well as an online survey with the focus group and local companies can help overcome the limitations within this study. Another variable to consider is the different types of drivers. It would be beneficial to compare results of this survey between short haul and long-haul drivers. Unfortunately, this was not asked in the study.

Lastly, the results can be used to find sensors for the REaCH System. The top responses for types of health and environmental information that could be useful to monitor could be integrated into the system. To do this, sensors must first be identified that fit the criteria. The REAcH System already has heart rate, oxygen saturation levels, blood pressure, and heat index. From the survey results, stability and hydration levels could be added for health sensors, and flammable gas detection for the environmental sensor. For stability sensors, wearable accelerometer sensor could be used to detect stability and falls. Hydration levels can be measured with wearable electrodermal hydration level sensors. Lastly, there are lower explosive level (LEL) gas detectors that can alarm when a flammable gas leak is occurring. Finding these sensors is not too hard, however, determining how to integrate it into the REaCH system could be challenging.

APPLICATION OF PUBLIC HEALTH COMPETENCIES

One foundational competency used in this project is MPHF4: Interpret results of data analysis for public health research, policy, or practice. The data analyzed was from the survey data which includes demographics, wearable technology perception, health information, and environmental information. From this data, I created tables, found significant values, and interpreted the results. The next foundational competency is MPH18 which is selecting

communication strategies for different audiences and sectors. This project included creating the survey and sending out the survey to the different companies, people, and the Facebook Advertisements. The surveys were thoroughly reviewed to make sure that the professional drivers that do the surveys have no problems and understand why they are answering it.

Next are the concentration competencies. One of them is EOHMPH7 which employs measures to control workplace injury and illness including engineering, education, regulations, incentives, and best practices. The purpose of the project is to look at the perception of professional drivers on wearable technology. Wearable technology can be used to help with the health and safety of these drivers and to help prevent acute and chronic diseases. Also, found information about the importance and relevance of using health monitoring tools in the professional driver's workplace setting. The next and last concentration competency is EOHMPH8. This is to examine information sources and public health indicators in occupational and environmental health. My project did not only look at survey data of the professional drivers but also looked at literature and wrote a paper on the results of the perception of technology use for professional drivers.

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