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ACCEPTANCE OF CLINICAL DATA REPOSITORIES BY GENERAL PRACTITIONERS

Lillian V. Ortiz-Fournier, Universidad del Turabo, Gurabo, PR, marianavanessa@yahoo.com
Mysore Ramaswamy, Southern University, Baton Rouge, LA, mysore@acm.org
Eulalia Márquez-Martínez, Universidad del Turabo, Gurabo, PR, emarquez@suagm.edu
Juan C. Rivera-Vázquez, Universidad del Turabo, Gurabo, PR, jjn0611@yahoo.com

ABSTRACT

Increasingly, countries are instituting policies to hold primary care practices accountable for managing chronic conditions and meeting clinical standards. These physicians are central to efforts to improve care coordination by managing referrals and by connecting care and medical information over time and across settings. However, when physicians are confronted with patients' wellbeing in situations lying out of their field of expertise, doctors might prefer to refrain themselves of making such calls. For a system aiming to help physicians making reliable decisions, sometimes out of their comfort zone, to be successful it will be necessary to determine the acceptance among those physicians. This investigation presents an analysis of the perceived usability and acceptance of a data warehouse designed with the purpose of helping pediatricians in the assessment of Attention Deficit/Hyperactivity Disorder (ADHD), a highly prevalent behavioral condition among children. The results were used later to determine the operational feasibility of the system.

Keywords: Technology Acceptance Model, Perceived Acceptance, Perceived Usability, Clinical Data Repositories, Decision Support Systems, Innovation Diffusion Theory

INTRODUCTION

Paper based data gathered at physicians' offices are disadvantageous because they are manual in nature, time consuming, located in a single physical location, prone to manual errors in data entry, slow to access and promote unnecessary redundancy [21]. Questionnaires had been used in pediatrics as an efficient mechanism for gathering standardized background information and providing baseline data for follow-up visits and, have been perceived as a better way for parents to share mental health and social concerns, compared with direct interviews [14]. Since the mid-1980s data warehouses have been developed and deployed as an integral part of a modern decision support environment. A data warehouse provides an infrastructure that enables businesses to extract, cleanse, and store vast amounts of corporate data from operational systems for efficient and accurate responses to user queries and empowers knowledge workers with information that allows them to make decisions based on a solid foundation of fact [18]. These clinical data repositories (CDRs) are large, usually relational databases that receive a variety of clinical and administrative data from primary electronic sources that are used to collect comprehensive data on large patient cohorts, assembled and stored over time, which not only permit these institutions to examine trends in utilization and outcomes, but also to perform sophisticated quality assurance and medical management queries independent from the systems that collect the data such as laboratory, management systems, among others [17]. Data in a warehouse can be accessed without tying up the information sources (e.g., holding locks or slowing down processing), accessing it does not incur additional costs and is available even when the original information source(s) are inaccessible [9]. The challenge is to integrate data from diverse information systems in the face of organizational or economic constraints that require those systems to remain autonomous [15]. Harrison and Palacio [10] state that clinical information systems are increasingly being used in health care organizations, and can improve efficiency as well as quality in the health care system.

As patients become increasingly involved in decisions about their own care, an improved understanding of lay reasoning and decision making will become essential for developing effective systems targeted at patient as well as health care provider populations [20]. However, as stated by Dugas et al. [4] clinical decisions should be taken in the foreseeable future by doctors and patients, not by machines. Clinicians need to take full advantage of the

capabilities of interorganizational systems and as a result trust the people that feed them, providing vital information or guidance concerning the patient's past medical history and current condition [7]. This means that the design of the decision aid may provide the physician with the most complete and accurate information in order to provide a correct assessment, but the interpretation as well as the treatment planning made by the clinician will always be necessary.

Through history of decision-making process it has been a common need to have different sources of information that comes from different places and/or different formats [2]. Best practices in the development of Clinical Decision Support Systems (CDSS) had been suggested to develop models of decision making that can simultaneously accommodate the beliefs, perspectives, and values of multiple decision makers, including those of physicians and patients; and methods for constructing and selecting among decision models of scalable granularity and specificity that are neither too general nor too specific for the case at hand. Primary care physicians such as pediatricians are on the front lines of care, providing first contact, and preventive and ongoing essential care. Increasingly, countries are instituting policies to hold primary care practices accountable for managing chronic conditions and meeting clinical standards. These physicians are central to efforts to improve care coordination by managing referrals and by connecting care and medical information over time and across settings [24]. According to Barkley [1] a behavioral trained physician employs the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria to make a differential diagnosis to assess what disorders the child has and has not. In addition, behavior rating scales developed for global or individual assessment as well as every piece of information gathered from interviews with parents or caregivers, and observations made to the child's behavior at the office are used to make the best possible educated guess about which specific disorder(s) the child may have. For instance, when physicians are confronted with patients wellbeing and behavioral situations doctors might prefer to refrain themselves of making such calls due to their uncertainty of the diagnosis [29].

CDSS can only be as effective as the strength of evidence base underlying them [3, 23]. Therefore, the integration of a CDSS with a centralized data warehouse that unites all relevant health care data is sought as a great way of improving clinical practice [26]. For a system aiming to help physicians making reliable decisions, sometimes out of their comfort zone, to be successful it will be necessary to determine the acceptance among physicians.

The results presented here are part of a broader investigation aiming to design a clinical data warehouse that will retrieve relevant data at the pediatricians' office of patients with indicators of Attention Deficit/Hyperactivity Disorder (ADHD), a highly prevalent behavioral condition among children. The data warehouse can be connected to a clinical decision support system with the purpose of helping pediatricians in the assessment of ADHD. The research described in this article focus on the analysis of perceived usability and acceptance of the proposed data warehouse system. The measures of both perceived usability and acceptance were obtained with the purpose of determining the operational feasibility of implementing the proposed system.

In the next sections we present the following topics: (a) the selected research framework to determine perceived usability and acceptance (b) the methodology for collecting the data (c) results and, (d) conclusions, limitations and further considerations.

RESEARCH FRAMEWORK

Models for Acceptance, Adoption and Diffusion of Technology

The Technology Acceptance Model (TAM) was not developed specifically for health care yet its being tested in several studies and increasingly proved to fit positively in the healthcare environment [11]. Its purpose was to investigate the factors affecting people's intentions of using technology and how those would be managed in order to increase acceptance of technology. TAM theory establishes that a person's intention to adopt a technology system is influenced by the perceived ease of use and the perceived usefulness. Perceived ease of use refers to the extent to which a potential user believes that the use of a particular technology will be effortless and perceived usefulness is then defined as the extent to which this potential user believes that the use of such system will enhance job

performance [27]. Holden and Ben-tzion's [12] review concludes that the perceived usefulness of an information technology system will make an impact when the clinicians accept and subsequently make use of such system. This conclusion means that a factor to account for an increase in the acceptance of technology among physicians is the fact that they must find such technology useful to their practice. Usability as applied to information technology has been defined as the ability of an information system to work properly for its intended purpose without causing frustration to the user [13]. Therefore, user's satisfaction with a particular technology sets a measure of its usability [25]. Figure 1 shows an illustration of the TAM.

Several studies using TAM focus on external variables that affect the Perceived Usefulness and Perceived Ease of Use or Usability of an information system. These variables are pertinent and specific of the technology being implemented. For example, Park et al. [19] research of the acceptance of a digital library describes a few specific variables such as: experience using computers, domain knowledge, English literacy, accessibility, relevance, interest in publishing, among others.

Moreover, there are other perceptions that affect the intention to accept and adopt the use of technology of general practitioners. Firth, Francis and Mellor [5] describe other reasons such as: the perception of a high cost of upgrading technology; concerns with security, law and ethics; and lack of proper care to the patient since the physician will need to divide the attention between the patient and the computer, among others. Furthermore, lack of utilization of information technology has been attributed to a perceived gap between information systems design and users understanding and actuality on matters pertaining to: hardware, software, objectives and values of the organizations, structures and other relater resources [11].

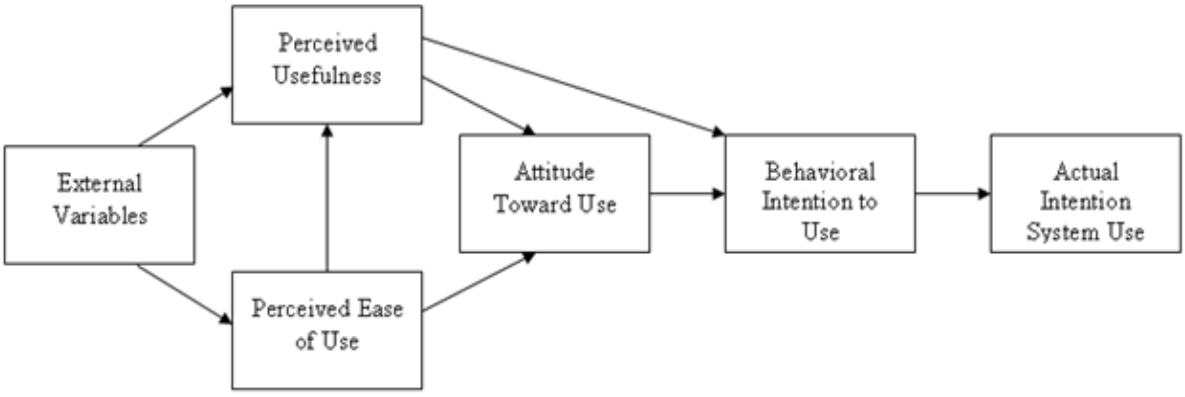

Figure 1. Illustration of the Technology Acceptance Model (adapted from Miller and Khera, 2010)

Finally, Venkatesh and Davis [28] found that acceptance of technology systems is also influenced by social and cognitive processes of users such as subjective norm, job relevance, output quality, among others.

Another theory explaining the factors that influence adoption of technology is Rogers' Innovation Diffusion Theory (IDT) [22] developed in the 60s. An innovation, as defined by Rogers, is any idea, process or object perceived as new by the intended user. The process described by Roger includes steps that an individual go through from his first knowledge of such innovation, his attitude to acceptance or rejection, to the decision to implement the new idea. Similar to TAM, the user's final decision to accept and implement an innovation is influenced by different factors such as: the characteristics of the innovation, the type of innovation, communications channels and, social factors. Rogers includes the following definitions of the characteristics of an innovation: relative advantage refers to the extent to which an innovation can be perceived as improving job performance or monetary gain; compatibility deal

with how the intended users perceives the innovation will fit into their set of values, needs and experiences; complexity is the ease is the way the innovation might by be learned by the intended user; triability is the degree to which an innovation can be piloted to test its relative efficacy; and observability refers to the positive outcomes intended users can see from the implementation of such innovation.

For this study we decided to use TAM as the research framework. Furthermore, an important part of the analysis and design of any information system is doing a feasibility analysis. There are four kinds of feasibility that can be analyzed: operational, economic, technical and, schedule. Financial feasibility of a technology system being implemented is focused when a pilot test aims to identify cost/benefit factors. In the same thread of thought technical and operational feasibility is then focused when the pilot test is designed to determine end-to-end usability after unit and integration tests are completed. Since pilot tests cannot reveal all possible scenarios, understanding in advance that feasibility and system acceptance issues may be intertwined provide an opportunity for project managers to anticipate breakdowns, blind spots in adoption, and opportunities to better exploit system capabilities [7]. Operational feasibility is the only one included as part of our investigation. It refers to the extent in which a technology system will be used by the intended users once is fully developed and implemented. We used the measure of the intended user perception of usability and acceptance of the proposed data warehouse to determine the operational feasibility of the system; being the intended users the pediatricians that come into contact with children having ADHD.

METHODOLOGY

Previous research has suggested using a positivist philosophical approach as well as a combination of both qualitative and quantitative methods to determine the factors influencing the adoption of new technologies in healthcare [8]. For this study we employed a qualitative-quantitative methodology to determine the perceived acceptance and usability of the proposed data warehouse system using the following research questions.

> RQ1: Will the pediatricians perceive that a system capable to aid with an accurate assessment of ADHD, with or without co-morbid disorders is useful in their practice?
>
> RQ2: Will the pediatricians accept in their practice a system that is capable to aid with an accurate assessment of ADHD, with or without co-morbid disorders?

A questionnaire was delivered to a sample of pediatricians of the metropolitan area of the Commonwealth of Puerto Rico. Demographic items were included and a five point Likert-type scale was used for the 12 questions intended to measure perception of usability and acceptance. The statistical tool selected for the analysis of the answers was the analysis of the medians and a correlation of the individual answers to their respective medians. The Likert scale is an ordinal scale that shows ordering of people's attitudes. Since the focus of this investigation is to use the perceived usability and acceptance measure to determine operational feasibility of the proposed data warehouse system we choose to perform an analysis of the medians of each of the 12 questions regarding usability and acceptance of the system. For instance, since the median is a central tendency measure that represents the distribution of participant's attitudes towards the proposed system and, as a result, establishes that the system will be operational when implemented. A correlation analysis is also presented to understand the influence of each construct surveyed on the pediatrician's intention to use the proposed system. The results of medians establish to which extent the pediatrician's perceive the system as useful for their practice and if they might accept the system when implemented. It presents the willingness of user's to accept and use the system. The system presented to participants in the questionnaire is a clinical decision support system connected to a data warehouse to assess ADHD.

The sample of pediatricians was selected from a list of all 1,093 pediatricians that are authorized by The Department of Health to practice medicine in Puerto Rico. This list included the name, address, working location, working phone number, first and second specialty, and identification numbers of each pediatrician. The RANDOM function was programmed to select 100 of them. Selected participants were contacted by phone and asked for their willingness

and disposition to participate in the project. Those who accepted were contacted at their offices, were the questionnaire was personally delivered. In some cases the instrument was left with the secretary and collected later, giving the participant enough time to complete it. Anonymity and confidentiality of the respondents is fully maintained in which the specific responses of every pediatrician are kept in the researchers' possession and will not be disclosed. Then, to comply with the American Health Insurance Portability and Accountability Act of 1996 (HIPAA), no specific health information of any physicians' patient was asked through the use of both questionnaires. The questionnaire was developed in Spanish, which is the language that the vast majority of the population in Puerto Rico is more proficient at. It contained the following 24 items: 12 demographic items regarding age, gender, race and ethnicity, number of years in the practice, education, and previous experience diagnosing mental health conditions; 6 questions for perceived usability and; 6 questions for perceived acceptance. It was designed entirely by the researcher and validated by experts in information technology discipline. The scale used for the answers to questions of perceived usability and acceptance included: 5 for Strongly Agree, 4 for Almost Agree, 3 for Neutral, 2 for Almost Disagree and 1 for Strongly Disagree. Participants were asked to read and rate their level of agreement with each usability and acceptance item whether they strongly agree or disagree in terms of the system's capabilities and the features described by each question. Appendix 1 shows all of the 24 items (translated to English by the author) of the questionnaire.

RESULTS

Analysis of Demographic Data

Using a confidence level of 95%, a sample of 94 was selected from the 368 pediatricians that worked mainly at the metropolitan region of the Commonwealth of Puerto Rico, which includes the municipalities of San Juan, Guaynabo, Bayamón, Trujillo Alto, and Cataño. This sample provides a confidence interval of 8.73, which is acceptable since this measure will be used mainly for decision purposes. From the 94 pediatricians only 71 answered which gives a 75% of response for this instrument. The questionnaire was validated for consistency and reliability using a Cronbach's alpha measure that showed strong consistency of .956. Table 1 shows frequencies and percentages of basic demographic data obtained.

Gender	Frequency	Percent(%)	ADHD knowledge	Frequency	Percent(%)
Female	38	53.5	Advanced	21	29.6
Male	33	46.5	General	45	63.4
Age Braquets			**1st Choice of Referral***		
25-34	5	7	Psicologist	5	7.4
35-44	11	15.5	Clinical Psicologist	8	11.8
45-54	24	33.8	School Psicologist	3	4.4
55-64	23	32.4	Child Psicologist	14	20.6
65+	8	11.3	Neurologist	25	36.8
Years of service*			Psychiatrist	13	19.1
<2	1	1.4			
2-10	8	11.3			
10-20	20	28.2			
21+	41	57.7	*Some participants didi not answer		

Table 1. Demographic data

We surveyed 38 women and 33 men. Sixty five percent of them had ages between 45 and 64 years old and, 75% had more than 10 years in the pediatric practice. Only thirty percent of the pediatricians considered themselves as having an advanced knowledge of ADHD. Twenty-seven pediatricians recalled assessing monthly an average of 8

patients with ADHD indicators. When asked to rank the professional that they select to refer patients with ADHD indicators the first three positions selected were, first the Neurologist, second the Psychologists with a specialty in children and adolescents, and third the Psychiatrist with a specialty in children and adolescents. Finally, less than twenty pediatricians recalled using one or more behavior scales in their practice.

Perceived Usability and Acceptance analysis

Questions used to measure the perceived usability include: 1) usability of data relating to ADHD; 2) the need to access data relating to ADHD; 3) usability of the proposed system; 4) usability of the proposed system to help minimizing wrong ADHD assessments; 5) usability of the proposed system to bring confidence in the correct ADHD assessments and; 6) usability of the proposed system to add value to the participants' medicine practice. The calculated median of perceived usability was 4, which corresponds to Almost Agree. This result was obtained using 68 of the 71 questionnaires, having only 3 missing cases. This means that most of the participants almost agree that the proposed data warehouse system is useful in their practice. It also shows on question number three, an outlier, one participant who did not agree at all.

Table 2 presents the correlations between the six questions used to measure perceived usability and their corresponding median values. It is observed that the strongest correlations are between the perceptions of usability of the proposed system in relation to the need to have access to ADHD data warehouse (PU_2), the confidence the system could bring to their assessments (PU_5) and, the value that he proposed system adds to the pediatricians practice (PU_6).

		PU_1	PU_2	PU_3	PU_4	PU_5	PU_6	Usability_ Median
PU_1	Pearson Correlation	1	.764**	.640**	.397**	.483**	.573**	.685**
	N	69	68	69	69	69	69	69
PU_2	Pearson Correlation	.764**	1	.807**	.524**	.648**	.718**	.865**
	N	68	69	69	69	69	69	69
PU_3	Pearson Correlation	.640**	.807**	1	.620**	.734**	.750**	.897**
	N	69	69	70	70	70	70	70
PU_4	Pearson Correlation	.397**	.524**	.620**	1	.702**	.743**	.752**
	N	69	69	70	71	71	71	71
PU_5	Pearson Correlation	.483**	.648**	.734**	.702**	1	.837**	.839**
	N	69	69	70	71	71	71	71
PU_6	Pearson Correlation	.573**	.718**	.750**	.743**	.837**	1	.915**
	N	69	69	70	71	71	71	71
Usability_ Median	Pearson Correlation	.685**	.865**	.897**	.752**	.839**	.915**	1
	N	69	69	70	71	71	71	71

Table 2. Correlations of Perceived Usability questions ** Correlation is significant at the 0.01 level (2-tailed).

Answer to question number three reflects how the participants consider accessing the proposed system to be useful and it shows a strong correlation with the other five questions. It is also observed that answers to the six questions have a strong correlation to their respective medians. These results show that participants' interest on collecting and having access to ADHD data as well as having access to the proposed system to minimize wrongful assessments,

have more confidence on their ADHD assessments and adding value to their medicine practice strongly influence the perception of usability of the proposed data warehouse system among the pediatricians surveyed.

Questions used to measure the perceived acceptance include: 1) interest on collection of data relating to ADHD; 2) interest in having access to a data warehouse relevant to ADHD; 3) acceptance of the proposed system to make a better ADHD assessment; 4) interest in accessing the proposed system to help minimizing wrong assessments of ADHD; 5) accept to access the proposed system to bring confidence in the correct assessment of ADHD and; 6) accept to access the proposed system that adds value to the participants' medicine practice. The calculated median of perceived acceptance was also 4. This result on the other hand was done using all the 71 questionnaires. This means that most of the participants are willing to accept the proposed system in their practice. There is no outlier on this graph. We also performed various correlations: (1) between the questions used to measure perceived usability and its respective median and, (2) between the questions used to measure acceptance and, between the medians of usability and the medians of acceptance.

Table 3 presents the correlations between the six questions used to measure perceived acceptance and their corresponding median values. It is observed that the strongest correlations are between the perceptions of acceptance of the proposed system in relation to their interest in accessing data relevant to ADHD (PA_2), their interest to make better ADHD assessments (PA_3), their interest to reduce wrongful ADHD assessments (PA_4), the confidence the system could bring to their assessments (PA_5) and, the value that he proposed system adds to the pediatricians practice (PA_6). Answer to question number two reflects how the participants would accept the proposed system and it shows a strong correlation with the other five questions. It is also observed that answers to the six questions have a strong correlation to their respective medians.

		PA_1	PA_2	PA_3	PA_4	PA_5	PA_6	Acceptance_ Median
PU_1	Pearson Correlation	1	.697**	.613**	.570**	.585**	.593**	.647**
	N	71	71	71	71	71	71	71
PU_2	Pearson Correlation	.697**	1	.876**	.850**	.863**	.838**	.923**
	N	71	71	71	71	71	71	71
PU_3	Pearson Correlation	.613**	.876**	1	.898**	.887**	.861**	.954**
	N	71	71	71	71	71	71	71
PU_4	Pearson Correlation	.570**	.850**	.898**	1	.875**	.884**	.939**
	N	71	71	71	71	71	71	71
PU_5	Pearson Correlation	.585**	.863**	.887**	.875**	1	.918**	.933**
	N	71	71	71	71	71	71	71
PU_6	Pearson Correlation	.593**	.838**	.861**	.884**	.918**	1	.924**
	N	71	71	71	71	71	71	71
Acceptance_ Median	Pearson Correlation	.647**	.923**	.954**	.939**	.933**	.924**	1
	N	71	71	71	71	71	71	71

Table 3. Correlations of Perceived Acceptance questions ** Correlation is significant at the 0.01 level (2-tailed).

Similar to results of perception of usability these correlations show that participants are willing to accept the proposed system to collect and access ADHD related data to minimize wrongful assessments, have more confidence

on their ADHD assessments and adding value to their medicine practice strongly influence the perception of acceptance of the proposed data warehouse system.

Finally, the correlation between median of perception of usability and the median of perception of acceptance was also measured to be .794. This value shows that the perceived usability has a strong influence on the willingness of the intended users to accept the proposed system.

CONCLUSIONS, LIMITATIONS AND FUTURE CONSIDERATIONS

The results presented here are part of a broader research aiming to design a clinical data warehouse designed with the purpose of keeping relevant data of patients with indicators of Attention Deficit/Hyperactivity Disorder (ADHD), a highly prevalent behavioral condition among children, at the pediatricians' office.

We performed an analysis of the perceived usability and acceptance of the proposed system that was presented to pediatricians as a first step to develop a clinical decision support system that might help in the assessment of ADHD among their patients. Two research questions were used to determine if pediatricians: (1) agreed that a system capable to aid with an accurate assessment of ADHD, with or without co-morbid disorders is useful in their practice and; (2) if they might accept in their practice a system that is capable to aid with an accurate assessment of ADHD.

A questionnaire was delivered to pediatricians including 12 questions, 6 referring to perceived usability and 6 for perceived acceptance using a five point Likert scale. Results were analyzed using the median of the answers and a correlation analysis of the answers and their medians. The calculated median was 4, "almost agree', for both perceived usability and acceptance. This result means that pediatricians selected in the sample perceive that the proposed system is capable of aiding them with an accurate assessment of ADHD. Further, it also means that it can be useful in their practice and, that they are willing to accept it in order to improve their ADHD assessment. The correlation analysis also demonstrates that the participants interest in accessing data relevant to ADHD, their interest to make better ADHD assessments, their interest to reduce wrongful ADHD assessments, the confidence the system could bring to participants assessments and, the value that the proposed data warehouse system adds to the pediatricians practice have strong influence over the perception of usability and acceptance, respectively. Since this is a qualitative study, these results give us the feedback to determine operational feasibility of the proposed system presented to the participants. In addition, given that our estimated error is less that 10% and with a 75% response, this measure of feasibility is strong enough to support the design and implementation of a data warehouse to keep data that is relevant to ADHD.

In delivering the questionnaire, despite being a short and straight instrument we encountered few limitations. The lack of computer literacy among pediatricians limited the delivery and decreased the response to it. Since, data warehouse and data marts are complicated concepts; it was difficult for the participants to visualize the capabilities of such a system. In addition, many of the participants would rather prefer in-depth interviews instead of questionnaires. Also, the lack of availability of pediatricians due to the many patients they had in their offices made it very difficult to rely only on this type of instrument. Finally, there are many health care professionals who are not inclined to accept technology at their office and in this case due to the fact that data warehouse and data marts are complicated concepts that are difficult to visualize.

Due to the limitations of using questionnaires with this type of intended users for a technology system that is very complicated we recommend building a non-functional prototype, first in order for the intended user to visualize better how it works and the advantages and/or disadvantages of using such a tool. In addition, we recommend the use of semi-structured in depth-interviews, as suggested in literature [8], to gain sufficient understanding on the topic from healthcare professionals and, to establish a better interaction with participants giving them the benefit to understand better the proposed system and express more educated opinions and descriptions of how the technology could be more useful and appealing. For instance, the best way to determine operational feasibility of a technology system capable to satisfy the needs of these physicians might be the use of in-depth interviews combined with the

Rapid application development methodology, which includes the building of a non-functional prototype in order for the physicians to relate better to the functioning of the system.

On the other hand, from our correlation analysis we observe the strong influence that certain characteristics of the proposed data warehouse have on the willingness to adopt it, such as: the value that might add to the participants' medicine practice and the fact that having the access to the data warehouse could bring confidence to pediatricians by helping to reduce wrongful assessments. For future research we recommend to explore the process of adoption of technology in medicine using Rogers' Innovation Diffusion Theory. For example, an analysis of compatibility, as defined by Rogers [22], might be related to our correlation between perceived usability and acceptance and the interest of our participants due to the need to improve an assessment that is somewhat out to their comfort zone. In addition, given the difficulty to grasp a data warehouse concept, as mentioned above building a non-functional prototype combined with the use of in-depth interviews, triability and observability can also be analyzed and relate to operational feasibility as well.

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APPENDIX 1

Questionnaire of Perception of Usability and Acceptance of a Clinical Data Warehouse to Collect Relevant Data for Assessment of Attention Deficit/Hyperactivity Disorder (ADHD)

A. Demographic data

1. Gender
2. Age
3. How many years practicing medicine?
4. Where is the office located? (by region)
5. What is your knowledge of ADHD? (general or advanced)
6. What is the type of your medicine practice? (public, hospital or private)
7. How many patients with ADHD indicators do you assess in a month?
8. How many of those assessed patients having indicators of ADHD have a positive ADHD diagnosis?
9. How many of those assessed patients having indicators of ADHD have a diagnosis that is not ADHD?
10. How many of those assessed patients having indicators of ADHD have disorders that are co-morbid with ADHD?
11. Are you a member of any Group or association related to ADHD? If your answer is yes, which?
12. Put the following health professionals in the order in which you make referrals of patients with ADHD indicators. (Starting with #1): Psychologist, Clinical Psychologist, School Psychologist, Neurologist, Psychologist of Children and Adolescents and, Psychiatrist of Children and Adolescents.
13. From the following standardized behavior questionnaires identify the ones that you use, if any, to assess ADHD in your practice: Child Behavior Check List (CBCL), Diagnostic Interview Schedule for Children (DISC-IV, Spanish), Conner's Teacher Rating Scale (short), School Behavior Inventory (Bauermeister, 1994), Disruptive Behavior Rating Scale (Barkley, 1998), Brief Impairment Scale (Spanish) and, Children's Global Assessment Scale.

B. Perception of Usability (5-Strongly Agree; 4-Almost Agree; 3-Neutral; 2-Almost disagree; 1-Strongly Disagree)

PU_1. Data of patients with ADHD coming from a data warehouse are useful in my practice.
PU_2. The access to a data warehouse with data that is relevant to the assessment of ADHD is necessary in my practice.
PU_3. Having access to a clinical decision support system connected to a data warehouse aimed to help in the assessment of ADHD is useful in my practice.
PU_4. Having access to a clinical decision support system connected to a data warehouse could reduce the mistakes in the assessment of ADHD in my practice.
PU_5. Having access to a data warehouse could bring me confidence in the correct assessment of ADHD.
PU_6. Having access to a clinical decision support system connected to a data warehouse aimed to help in the assessment of ADHD adds value to my practice.

C. Perception of Acceptance (5-Strongly Agree; 4-Almost Agree; 3-Neutral; 2-Almost disagree; 1-Strongly Disagree)

PA_1. I am interested in the collection of data of patients with ADHD.
PA_2. I am interested to have access to a data warehouse that is relevant to an ADHD assessment.
PA_3. I will accept having access to a clinical decision support system connected to a data warehouse aimed to help in the assessment of ADHD.
PA_4. I am interested to have access to a clinical decision support system connected to a data warehouse that could help reduce the mistakes in the assessment of ADHD.
PA_5. I could accept having access to a data warehouse that could bring me confidence in the correct assessment of ADHD.
PA_6. I could accept having access to a clinical decision support system connected to a data warehouse that adds value to my practice in the assessment of ADHD.