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Factors Influencing Physicians in the Adoption of E-Detailing in the in-Vitro Diagnostic Industry

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ABSTRACT

The pandemic has hastened the need for in-vitro diagnostic (IVD) companies to blend digital and traditional sales strategies. This study explores factors influencing physicians' adoption of e-detailing in the IVD industry. Dependent variables include physicians' perceptions and intention to use e-detailing, while independent variables encompass the socio-demographic characteristics of the respondents. Physicians' perceptions were also explored if they influenced intentions to use e-detailing. The study excluded physicians outside the National Capital Region and those not involved in patient consultations. With 408 participants, descriptive statistics and Structural Equation Modeling were utilized to identify sociodemographic characteristics influencing physicians' perceptions, behavioral intentions, and intention to use e-detailing. A thematic analysis was used to identify common themes doctors use to obtain information about IVD tests. Approximately 76% of respondents find e-detailing advantageous, with 70% agreeing on its compatibility and 80% believing it is easy to use. The majority (77%) consider using e-detailing to stay updated on in-vitro diagnostic tests, and 75% intend to use it regularly in the future to obtain such information. However, only 43% express a willingness to switch from face-to-face detailing. More than half of the respondents (52%) prefer to use a combination of face-to-face visits and e-detailing. The study found that the years of medical practice and the medical hierarchy significantly influenced physicians' perceptions of adopting e-detailing. Physicians who viewed e-detailing as advantageous, compatible with their professional needs, and less complex were more inclined to adopt the digital tool for their practice. However, demographic factors did not significantly affect physicians' intentions regarding e-detailing. This study recommends creating high-quality e-detailing materials for Filipino physicians, ensuring accessibility, personalizing content, incorporating multimedia, promoting two-way communication, regularly updating, offering expert interaction, and continuously collecting physician feedback.

INTRODUCTION

COVID-19 is a worldwide emerging infectious disease targeting the respiratory system. It is caused by the SARS-CoV-2 virus, which was first reported in Wuhan province in China last December 2019 (Liu *et al.*, 2020). Due to its continuous spread globally, the World Health Organization declared it a pandemic on March 11, 2020 (Majumdar *et al.*, 2020).

With the challenges brought about by the COVID-19 pandemic, clinicians became more interested in In-Vitro Diagnostics (IVD) to be updated with the new diagnostic tests that can help diagnose and monitor this disease. The US Food and Drug Administration defined in-vitro diagnostic products as assays and instruments used to examine specimens taken from the human body such as blood, urine, and other body fluids to diagnose and monitor diseases. In-vitro diagnostic tests are also used in disease prognosis and treatment management (Song and Zhu, 2020). It has been widely cited that in-vitro diagnostic tests are responsible for up to 70% of medical decisions made by clinicians (Davis, 2014). Therefore, appropriate IVD tests are needed to know better the causative agent for emerging infectious diseases like COVID-19 (Graziadi *et al.*, 2020).

The in-vitro diagnostic industry is composed of companies supplying medical laboratories with IVD products utilized by healthcare professionals, healthcare institutions, and even patients themselves in managing medical conditions (Davis, 2014). Unlike the pharmaceutical industry, wherein companies direct their promotion to clinicians through various marketing communication tools, the IVD industry focuses more on creating face-to-face marketing campaigns intended for the stakeholders of medical laboratories like pathologists, medical technologists, and hospital administrators.

In the study conducted by Engel N. *et al.* (2016), Global Health Delivery Online (GHDonline) Expert Panel participants highly suggest making clinicians in public and private sectors more aware of the updates regarding the IVD tests available in the market to encourage its utility in their patient management. Nandy and Pal (2016) state that detailing, a process of introducing the product and highlighting its advantages to clinicians has been a useful marketing communication tool in the pharmaceutical industry for over the last thirty to forty years. Also, in a study conducted by Pokharel (2017), it has been found that detailing to clinicians is the most effective promotional and marketing tool in the pharmaceutical industry.

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However, the researcher has not found any studies that discuss detailing as a marketing communication tool in the IVD Industry.

Moreover, in 2020, research conducted by consulting firm Accenture, it has been realized that physicians became more interested in knowing more information on patient drug therapies, medical diagnostic tests, and manufacturers' support services. Moreover, despite the in-person restrictions in place, more than half of the physicians who responded to the survey said they are curious to learn about new treatments and diagnostic tests, and 61 percent said they are interacting with reps more now than they were before the COVID-19 pandemic.

GlobalData (2021) conducted a survey of experts in the pharmaceutical sector from 19 April to 18 May 2021 and found that 75% of the 456 participants thought that virtual interaction would continue after the COVID-19 issue passed, either as a stand-alone option or as a combination of in-person and virtual encounters. Also from the same survey, only 25% of healthcare professionals (HCPs) anticipated a return to pre-pandemic levels of in-person encounters, highlighting the shift in physicians' preferences and emphasizing that pharmaceutical and medical diagnostic companies will need to look for novel approaches such as new software or tools to forge meaningful connections. Additionally, according to a survey by Accenture (2020), 87% of HCPs want to continue holding virtual meetings or a combination of virtual and in-person meetings even after the pandemic has ended. Only 10% favor returning to the customs of in-person meetings before COVID.

The constraints of face-to-face marketing activities brought by COVID-19 even beyond the pandemic has made IVD companies consider electronic detailing or e-detailing, a widely used marketing communication tool in the pharmaceutical industry. Balkanski and Getov (2019) define E-detailing as a marketing tool that utilizes an online channel and information technology to promote pharmaceutical products. Moreover, Davidson and Sivadas (2014) state that physicians prefer e-detailing since it enables them to access product information at their most convenient time.

While e-detailing is highly encouraged nowadays due to the limitations of access to doctors' clinics, most physicians still believe that it will never replace face-to-face interaction with pharmaceutical sales representatives (Balkanski and Getov, 2019). Additionally, a survey conducted in Japan by Nikkei Research Inc. (2021) highlighted the relevance of PSRs and their significant role in spreading the word about new medical products and technology, however, it was also mentioned that digital content is set to grow. Hence, the COVID-19 pandemic has forced companies in the pharmaceutical and IVD industries to adapt and synergize digital and traditional sales and marketing approaches. However, although digital marketing tools like e-detailing have a vast potential to be more efficient and convenient for clinicians and medical sales representatives, digital execution is a considerable challenge for developing

countries like the Philippines (Syrkiewicz-S'witala *et al.*, 2016). Also, Balkanski and Getov (2019) mentioned that the initial implementation of e-detailing might bear additional costs in a company's marketing budget.

This research aims to determine the influence of different socio-demographic factors and innovation perceptions of Filipino physicians towards the adoption of e-detailing and identify their source of information about the trends in the in-vitro diagnostic industry. Participants of this study are patient-facing physicians in the National Capital Region of the Philippines, where most of the doctors in the country are practicing. Furthermore, this study's variables are anchored in Roger's diffusion of innovations theory (DOI) and the Technology Acceptance Model (TAM), the two most common theories for technology adoption in the medical industry.

Lastly, this study's outcome may encourage IVD companies to employ e-detailing as an essential communication tool that can help keep physicians updated with the trends in the IVD industry. As a result, the use of inappropriate tests will be reduced, which will eventually improve physician's patient management.

MATERIAL AND METHODS

Research Design

This research study will employ a descriptive correlational design to accurately portray the characteristics of research stakeholders and determine whether innovation perceptions on e-detailing influence behavioral intention and socio-demographics.

Subjects and Study Site

The respondents of the study are patient-facing physicians practicing in the National Capital Region who are below the age of sixty. Hence, physicians who are practicing outside NCR and whose practice does not involve patient consultations, such as pathologists, anesthesiologists, radiologists, nuclear medicine specialists, and forensic medicine specialists, will not be included in the study. Senior or aging physicians (aged 60 and above) will be excluded from this research since they are considered to be part of the vulnerable population. The total sample size of respondents is 408 out of the 11,426 physicians.

Research Instrument

The research instrument mainly uses seven different articles to adapt the current questionnaire, namely:

Integrating TPB, TAM and DOI Theories

An empirical evidence for the adoption of mobile banking among customers in Klang Valley, Malaysia by Alam *et al.* (2018) with Cronbach's alpha values ranging from 0.705 to 0.888

Perceptions of Adopters Versus Non-Adopters of a Patient Portal

An application of diffusion of innovation theory by Emami *et al.* (2018) with Cronbach's alpha values ranging from 0.82 to 0.90.

Knowledge and Attitudes of Doctors Towards E-Health Use in Healthcare Delivery in Government and Private Hospitals in Northern Uganda

A cross-sectional study by Olok *et al.* (2015) with most of the Cronbach's alpha values are 0.7 except for complexity with an alpha value below 0.7.

Are Physicians Likely to Adopt Emerging Mobile Technologies?

Attitudes and Innovation Factors Affecting Smartphone Use in the Southeastern United States by Putzer and Park (2012) with Cronbach's alpha values ranging from 0.610 to 0.916, which is considered within the acceptable range.

A New Debate for Turkish Physicians

E-Detailing by Ventura, Baybars, and Dedeoglu (2012) with Cronbach's alpha values ranging from 0.819 to 0.919.

Perceptions of the Provision of Drug Information, Pharmaceutical Detailing, and Engagement with Non-Personal Promotion at a Large Physician's Network

A mixed-methods study by Hincapie *et al.* (2021). Cronbach's alpha values were not mentioned.

Physicians' Perceptions of Medical Representative Visits in Yemen

A qualitative study by Al-Areefi *et al.* (2013). Furthermore, it made use of the Likert scale to determine the overall response of the participants.

Data Gathering Procedure

The survey questionnaire was administered electronically using google forms through letters addressed to different medical departments of hospitals located in NCR with the permission of the Philippine College of Physicians (PCP) secretariat. The researcher also conducted a pilot test to ensure that all questions on the instrument are straightforward and that respondents fully understand all the items in the research instrument. After administering the pilot testing, the researcher will measure and analyze the internal consistency of the research instrument, with the help of a statistician, using Cronbach's alpha test. This is to ensure that the questionnaire's internal consistency is effective and reliable.

Ethical Considerations

The researcher assures the participants that all information gathered in this survey will remain private and confidential in compliance with the Data Privacy Act of the Philippines. The identity of the participants will not be disclosed and will remain anonymous. With this, participants are not required to provide their names and other information that will reveal their identity. Lastly, this research has obtained ethical clearance from the University of Santo Tomas Graduate School Review Ethics Committee.

Data Analysis

Descriptive and factor analysis will be used to answer research questions 1 and 2, which are to know what perceptions influence physicians' adaption to e-detailing and identify whether Filipino physicians have the intention to use digital tools to acquire information about new trends in the IVD industry. On the other hand, Structural Equation Modeling (SEM) will be utilized to identify which socio-demographic characteristics of physicians in the Philippines influence their perception towards e-detailing (research question 3), which perceptions of the physicians influence their behavioral intention to use e-detailing (research question 4), and which socio-demographic characteristics of physicians in the Philippines influence their behavioral intention to use e-detailing (research question 5). Lastly, a thematic analysis will be used to find the common theme that the doctors use to get information about IVD tests (research question 6).

Technology Acceptance Theories in the Health Industry

Patwardhan *et al.* (2014) state that the occurrence of technology acceptance among physicians has been viewed as an individual user's acceptance due to the inevitable emergence of essential technology in their practice. The two most common theories used in explaining user acceptance phenomenon are the Technology Acceptance Model (TAM), for the effect of perceived beliefs on the innovation to behavioral intention to use, and the Diffusion of Innovation Theory, for the impact of innovation factors on user's perception of the innovation (Patwardhan *et al.*, 2015). Moreover, Hameed *et al.* (2012) state that TAM and DOI theories have been widely used in successfully identifying and predicting individual user acceptance or adoption of information technology innovation.

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) by Davis (1989) has been widely used to examine the physicians' technology acceptance phenomenon for various electronic health industry technologies (Putzer and Park, 2012). Also, TAM is recommended to be integrated into a framework involving DOI and TRI to examine innovation like the internet's adaption pattern among physicians (Patwardhan, Pandey, and Dhume, 2014).

Diffusion of Innovation Theory (DOI)

Diffusion of Innovation (DOI) states that an adaptation of innovation starts when a specific population initially becomes aware of a new way of doing things and then develops an attitude towards it. After which, a decision to adopt or reject the innovation will be made. The diffusion result is that people would adopt a new behavior or idea and eventually become part of their norm (Scott and McGuire, 2017). This approach can be adopted in the

context of physicians who have similar attributes like specialty and educational qualification and their adoption as a decision-making phenomenon (Patwardhan *et al.*, 2014).

Relative Advantage (RA)

Relative Advantage (RA) is defined as the level to which people assume that the new innovation or technology is better than the traditional one (Al-Rahmi *et al.*, 2019). The studies of Anwar (2020), Olok *et al.* (2015), and Putzer and Park (2012) have shown that RA is significant in influencing physicians’ intent to use innovation in the medical industry. Furthermore, the study of Alkhateeb & Doucette (2009), cited by Balkanski & Getov (2020)1, shows that RA has a significant positive association in adopting e-detailing in the pharmaceutical industry. In this study, which focuses on the in-vitro diagnostic industry, RA will be utilized to assess whether physicians perceive e-detailing as more convenient than traditional face-to-face detailing in acquiring information about IVD tests.

Compatibility (CP)

Al-Rahmi *et al.* (2019) and Emani *et al.* (2018) defined Compatibility (CP) as to how people feel that the innovation is compatible with their standards, previous involvements, and the probable adopters’ desires. Previous research have found a significant relationship between CP and the intent to use innovation (Anwar, 2020; Olok *et al.*, 2015; and Putzer and Park, 2012) and adoption of e-detailing (Alkhateeb & Doucette, 2009, cited in Balkanski & Getov, 2020).1But, in the past study of Emani, Compatibility did not emerge as a distinct factor. It failed to be distinguished with Relative Advantage. As explained by Karahanna *et al.*, as cited in (Emani 2018), the idea of Compatibility in the DOI theory idea as defined by Rogers (1962), focuses on needs which is one of the elements of Relative Advantage. Karahanna *et al.* (2006), as cited in Emani *et al.* (2018), proposed four new distinct constructs of Compatibility: preferred work style, existing work practices, prior experience, and values.

As suggested by Karahanna *et al.* (2006), as cited in Emani *et al.* (2018), future research, which will apply DOI theory, should focus on one or more of the four new constructs

to assess whether Compatibility emerges as a distinct factor that predicts adoption of innovation. In this study, CP will be used to determine if physicians perceive e-detailing as more appropriate in their preferred work style, existing work practices, and prior experience.

Complexity (CO)

Another DOI factor considered by past studies in assessing the intention to use innovation (Anwar, 2020; Olok *et al.*, 2015; and Putzer and Park, 2012) and adoption of e-detailing in the pharmaceutical industry (Alkhateeb & Doucette, 2009, cited in Balkanski & Getov, 2020)1 is Complexity. Complexity is the degree to which an innovation is perceived to be easy to use (Anwar, 2020). This variable is adapted in this research to analyze if physicians perceive e-detailing as an easy-to-use tool to access information about diagnostic tests.

Observability (OB) and Trialability (TR)

Observability (OB) is the idea wherein the innovation benefits are visible to others (Emani, 2018). The visibility of a particular innovation’s results motivates the rest of a specific group’s population to adopt the new technology or idea (Anwar, 2020). Meanwhile, Rogers (1962) defined Trialability as the capability to test an innovation on a limited basis to explore its implementation procedure, acceptability, and possible results. However, TR and OB will not be included in this study since e-detailing and even traditional face-to-face detailing are not commonly used by the IVD companies making it hard for physicians to observe the results of e-detailing applications in the in-vitro diagnostic industry. Also, measuring TR and OB might be a challenge due to the lack of physicians’ exposure to utilize e-detailing as a source of information for IVD tests in their practice.

RESULTS AND DISCUSSION

Perception of Physicians on the Advantage of E-Detailing over Face-to-Face Detailing

Based on physicians’ perceptions toward e-detailing, as indicated by the responses provided on Table 1, the following observations can be made regarding the relative advantages of e-detailing.

Table 1: Perception of Physicians on the Advantage of E- detailing over Face-to-Face detailing

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
Using e -detailing enables me to find information about in -vitro diagnostic tests more quickly	48	320	26	14	408
Using e -detailing improves the quality of my management to patients	29	351	28	0	408
Using e -detailing improves the quality of medical work I do	55	308	45	0	408
Using e -detailing enables me to access information about in -vitro diagnostic tests in my own convenience	93	282	26	7	408
Using e -detailing increases my work productivity	47	327	34	0	408

E -detailing is more efficient than face -to -face detailing because I can obtain information about in -vitro diagnostic tests from reliable sources	66	279	47	16	408
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In the first item, “Using e-detailing enables me to find information about in-vitro diagnostic tests more quickly”, 320 physicians, which is 78.43% of the respondents, agreed with the following statement while 48 respondents strongly agreed while 14 of them strongly disagreed. This suggests that e-detailing provides a relative advantage in terms of efficiency and time-saving compared to traditional methods of gathering information.

E-detailing as a digital communication approach provides physicians with several benefits that allow them to locate information about in vitro diagnostic tests more expeditiously. Most e-detailing platforms offer searchable databases that enable physicians to quickly access specific information about in vitro diagnostics (Lettieri *et al.*, 2022). These databases are typically designed to facilitate the easy retrieval of product specifications, clinical information, research studies, and other pertinent data. Search filters and keywords can be used to locate the particular tests that a physician is interested in, thus saving time compared to manually searching through printed material or websites. An e-detailing platform can provide physicians with tailored and personalized content based on their individual needs and interests. This content can be delivered through user profiles or preferences that focus on in vitro diagnostic tests that correspond to the specialty, patient population, or areas of interest of the physician. Tailored content ensures that the most pertinent and applicable information to the practice is readily available, thus eliminating the need to search through unrelated materials. In addition, e-detailing platforms often feature intuitive and interactive navigation capabilities (Balkanski & Getov, 2019). Physicians can use menus, hyperlinks, and clickable elements to quickly navigate through the information, allowing them to access different sections, subtopics, or related resources. Collapsible sections, tabs, or sidebars enable physicians to quickly skim through the content, focusing on the areas of greatest interest or relevance, thus speeding up information retrieval. E-Detailing also utilizes multimedia resources such as video, animation, infographics, and interactive tools to provide information about in vitro diagnostic tests more effectively. These formats can help to illustrate complex concepts, illustrate test procedures, or demonstrate clinical applications succinctly and engagingly. E-detailing allows physicians to gain a better understanding of key information by viewing a video demonstration or an infographic, thus, reducing the time needed to comprehend the principles, advantages, or interpretation of the test. E-detailed platforms can provide up-to-date information on in vitro diagnostic tests in real-time. As the results of new research, clinical guidance, or regulatory changes become available, the platform can update the information in

real-time to ensure physicians are kept up to date. This removes the need for manual searches or reliance on outdated printed materials, as real-time updates ensure physicians can access the most recent information about diagnostic tests immediately. Furthermore, e-detailed platforms integrate with other digital sources to provide physicians with timely access to relevant information about in vitro diagnostic tests when they review patient cases or make clinical decisions. By connecting different digital tools in a workflow-friendly manner, physicians can easily locate the information they need without having to perform separate searches or interruptions in their clinical practice.

For the second item “Using e-detailing improves the quality of my management to patients”, there were 351 respondents, or 86.03% who agreed with the statement. On the other hand, 29 of the respondents strongly agreed, and none of the respondents disagreed with the statement. This perception implies that e-detailing provides valuable information and resources that positively impact physicians’ ability to provide effective medical care.

E-detailing has a positive impact on the quality of physician-patient management in the in vitro diagnostic industry (Zaman *et al.*, 2018). In vitro diagnostic testing platforms offer physicians access to the most recent information on in vitro diagnostic tests. From product updates to clinical guidelines, to research findings, to treatment protocols, physicians can access the latest and greatest information. This means that physicians can make informed decisions about their patients and provide evidence-based care to them. It provides physicians with continuous learning opportunities. By broadening the knowledge and skills available to physicians, they can improve their diagnostic, treatment, and patient management capabilities. Access to education and training programs can improve the quality of the physician’s patient management by increasing their expertise and competence. E-detailing platforms can provide physicians with patient-specific information, such as test results, treatment options, and personalized recommendations. By leveraging this information, physicians can tailor their management plans to meet the individual needs of each patient. It also provides physicians with the ability to access patient information remotely and effectively, allowing them to deliver personalized and tailored care. This personalized approach improves patient management by taking into account the individual characteristics of the patient and optimizing treatment outcomes. It is often used to facilitate communication and collaboration between healthcare professionals. For example, physicians can engage in discussion, seek the opinion of experts, and engage in virtual consultations. This collaboration allows physicians to take advantage of

the collective knowledge and experience of colleagues, resulting in enhanced patient management.

E-detailed platforms can be used to facilitate collaborative decision-making and provide comprehensive care for patients. For instance, physicians can use e-detailed platforms to remotely monitor and follow up on patient progress. This can be done in addition to traditional clinic settings, such as reviewing test results and providing remote consultations. This ongoing monitoring and follow-up helps to improve patient management by providing early intervention, early detection of issues, and ongoing care. E-detailing can provide a number of benefits in terms of patient management, however, privacy, confidentiality, and in-person consultation are all considerations that must be taken into account. Furthermore, physician proficiency and willingness to adopt the relevant technologies can also affect the degree to which e-detailing improves patient management.

For the third item “Using e-detailing improves the quality of medical work I do”, the majority of the respondents, with 308 responses (75.49%) agreed with the statement, while 55 strongly agreed and 45 disagreed. This perception suggests that e-detailing enhances decision-making skills, enhances treatment strategies, and enhances the overall quality of medical care.

The utilization of e-detailing within the in vitro diagnostic industry has the potential to improve the quality of the medical work performed by physicians. By utilizing e-detailing platforms, physicians can gain access to a broad range of information relevant to in vitro diagnostic tests, such as product details, clinical information, research results, and best practice guidelines. This comprehensive and readily available information equips physicians to make more informed decisions and provide superior medical care. By increasing the accuracy and relevance of their work, physicians can improve the quality of care, enhance patient outcomes, and minimize variations in practice. Evidence-based guidance is often included in the e-detailing platform, which can be used to ensure that medical work is in line with the most recent evidence and best practices. E-detailing helps to disseminate evidence-based guidance and assists physicians in implementing it into their medical work. E-detailing platforms offer educational resources to physicians, such as webinars, online courses, and interactive modules. These resources provide physicians with the opportunity to engage in ongoing medical education, which allows them to stay up-to-date with the latest developments and developments in the field, as well as to expand their knowledge and capabilities. This can help to improve the quality of medical work by keeping physicians informed of emerging technologies and diagnostic approaches. These platforms allow physicians to participate in virtual conversations, exchange knowledge, and interact with experts and colleagues (Bounthavong *et al.*, 2022). This collaboration encourages knowledge sharing and allows physicians to gain insight and access different perspectives. By sharing knowledge and expertise, physicians can increase their

efficiency and effectiveness in their medical work. By utilizing e-detailing platforms to access information and resources quickly and easily, physicians can save time without having to attend physical meetings or search for literature. This can allow them to dedicate more time to patient care or other important aspects of their practice. For the item “Using e-detailing enables me to access information about in-vitro diagnostic tests in my own convenience”, more than half, which is 69.12% of the respondents, agreed with the statement. There are 93 respondents who strongly agreed while there are 7 who strongly disagreed. This perception suggests that e-detailing provides flexibility and accessibility, allowing physicians to gather relevant information when and where they need it.

The use of e-detailing in the IVD industry is essential in providing physicians with the ability to access information regarding diagnostic tests in a convenient manner. Digital platforms enable physicians to access e-detailed materials, such as product details, clinical information, and guidance, from their computers, tablet devices, or mobile devices (Ratta *et al.*, 2021). This makes it easier for physicians to access diagnostic test information at the time and location of their choice, thus eliminating the need for in-person meetings or visits by sales representatives. By utilizing e-detailing, physicians can review diagnostic test information in a shorter period of time, eliminating the need for traditional methods of detailing. E-detailing provides physicians with the ability to schedule their e-learning activities in a way that allows them to fit it into their busy schedules (Reni, 2020). This allows them to access e-learning materials at any time of the day or night, allowing them to stay up-to-date with the most recent diagnostic tests without having to interrupt their day-to-day work. With e-learning, physicians are able to explore the information in a self-paced manner, allowing them to navigate through the material, re-visit certain sections, and pay particular attention to areas that are of interest or relevant to their practice, thus gaining a more comprehensive understanding of diagnostic testing and its potential applications. An e-detailing platform typically includes interactive components, such as quiz, case study, and simulation, to actively engage physicians. These interactive elements help to retain knowledge and facilitate application. Doctors can test their knowledge, apply it to hypothetical situations, and explore various aspects of diagnostic testing in an engaging and immersive way. This interactive element enhances the learning process and facilitates physicians’ comprehension of the information. With e-detailing, physicians can be kept informed of the latest developments in diagnostic tests, including updates, modifications, and new applications. Digital platforms are constantly updated to ensure that physicians are kept up to date with the most recent product releases, clinical trial results, research discoveries, and guidance.

For the item, “Using e-detailing increases my work productivity”, 327 or 80.15% of the respondents answered “agree” with this statement, also 47 strongly

agreed and 34 strongly disagreed. This suggests that the majority believe that e-detailing provides benefits such as streamlined access to information, efficient communication, and the ability to multitask effectively.

E-detailing enables physicians to access a broad range of information about IVD tests, such as product specifications, clinical information, research results, and educational materials, in real-time, tailored to their individual needs. This allows physicians to quickly acquire the necessary data and inform their decisions. By providing comprehensive and current information efficiently, physicians can reduce the amount of time they spend searching for information from a variety of sources. It is often possible to engage with videos, as well as virtual demonstrations, while simultaneously managing other tasks such as patient records or research. This allows physicians to maximize their time utilization and work productivity by multitasking. Effective communication channels facilitate a rapid exchange of information and eliminate the need for long-distance meetings or telephone calls, thus increasing work productivity.

For the last item “E-detailing is more efficient than face-to-face detailing because I can obtain information about in-vitro diagnostic tests from reliable sources”, a total of 279 physicians responded to the survey, with 68.38% agreeing with the statement. There were 66 respondents strongly agreed, 47 disagreed, and 14 respondents strongly disagreed with the statement.

In the in vitro diagnostic industry, e-detailing provides physicians with a range of benefits, such as direct access to reliable sources of information, the ability to avoid intermediaries or misinterpretation, and the consolidation of information from multiple sources into one central location (Viseven, 2023). This consolidation of information ensures that physicians can rely on accurate and reliable information that has been thoroughly reviewed. Moreover, The purpose of e-detailing platforms is to provide physicians with the most current and pertinent information regarding diagnostic tests. This is achieved through the rapid updating of content on the platform by manufacturers and other stakeholders in response to new data, findings from research, safety data, or modifications to product specifications. This provides physicians with the assurance that the information they are receiving is up to date and in accordance with the relevant regulatory standards and guidelines. E-detailing material is often subject to a rigorous peer review process, which ensures that the information presented is accurate and of scientific value. This peer review process is typically conducted by experts in the field of the subject matter or other relevant professionals. This adds an extra layer of credibility and assurance to the content, providing physicians with the assurance that it is accurate and reliable. Additionally, e-detailed materials are often transparent and traceable, allowing physicians to identify the source of the information, such as links to scientific studies or clinical trials, as well as references to publications. This level of transparency allows physicians

to independently verify the accuracy of the information and make decisions based on its credibility.

There are a small number of physicians who disagreed and strongly disagreed with some of the statements presented in Table 2. Some may be resistant to technological advancements and prefer traditional methods of communication and information exchange. They may feel uncomfortable with the shift from face-to-face interactions to digital platforms. Moreover, e-detailing primarily relies on digital communication channels, which may lack the interpersonal connection that they value. They may prefer in-person meetings or physical product demonstrations to better understand and evaluate the diagnostic products. E-detailing platforms are often standardized and may not provide the same level of customization as face-to-face interactions (Kim & Chang, 2022). Doctors may feel that their specific needs and concerns are not adequately addressed through digital means. With the increasing digitalization of information, they might feel overwhelmed by the sheer volume of electronic communication they receive. It contributed to information overload, making it challenging for doctors to filter and prioritize relevant information. Doctors also deal with sensitive patient information, and there may be concerns about the security and privacy of data transmitted through e-detailing platforms. Some worry about the potential for data breaches and unauthorized access to patient information.

In order to address these issues and promote adoption, there are a number of steps that can be taken. The primary focus should be to tailor the content and communication of the e-detailing platform to the individual needs and preferences of the doctor. This can be achieved by providing comprehensive training and ongoing support to the doctor, such as technical assistance, tutorials, and resources, to ensure the doctor feels comfortable and confident using the digital tools (Ftouni *et al.*, 2022). Additionally, data security and privacy should be a priority, with strong security measures and encryption protocols in place to reduce the risk of data breaches or unauthorized access. Also, a hybrid model should be adopted, combining e-detailing and occasional in-person or physical product demonstrations, in order to create a more flexible and comprehensive communication strategy. Finally, efforts should be made to demonstrate the benefits of e-diagnostic services, such as improved time efficiency, access to information, and improved patient care. By demonstrating the value and positive results of digital engagement, resistance to change can be overcome.

Perception of Physicians on the Compatibility with E-Detailing

For the first item “Using e-detailing is completely compatible with the current situation (pandemic)”, there are 327 respondents or 80.15% of the physicians agreed to that statement while 59 agreed, and 22 disagreed. This implies that most respondents believe that e-detailing is

Table 2: Perception of Physicians on the Compatibility with E-detailing

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
Using e-detailing is completely compatible with the current situation (pandemic)	59	327	22	0	408
E-detailing of in-vitro diagnostic tests suits my general needs better than face-to-face detailing.	37	255	97	19	408
E-detailing fits my time management style than face-to-face detailing because it allows me to conduct longer and deeper research about in-vitro diagnostic tests	38	297	68	5	408
E-detailing suits my schedule because it enables me to access information about in-vitro diagnostic tests in my free time	86	292	17	13	408
E-detailing will fit well with my work style	86	264	55	3	408

compatible with the pandemic. To be specific, e-detailing is a viable solution for pharmaceutical and diagnostic companies to engage with physicians effectively during the pandemic (Adkonkar et al., 2022; Hincapie et al., 2021). Factors influencing physicians' adoption of e-detailing include convenience, flexibility, time-saving, enhanced accessibility to remote areas, safety considerations, technological proficiency, and interaction quality. Convenience allows physicians to access information and engage with representatives from diagnostic companies at their own convenience, eliminating the need for specific time slots for in-person meetings. Time-saving is particularly valuable during the pandemic when physicians are often overwhelmed with patient care and other responsibilities. E-detailing also bridges the geographical gap between physicians and diagnostic companies, allowing them to connect virtually with industry experts and gain necessary information and support. Safety considerations are another factor influencing physicians' adoption of e-detailing. The pandemic has highlighted the importance of minimizing face-to-face interactions to reduce the risk of viral transmission. E-detailing provides a safer alternative to in-person meetings, allowing physicians to maintain social distancing measures while still accessing valuable information about diagnostic products and services. Technological proficiency is crucial for physicians' adoption of e-detailing. While not all physicians may have the same level of proficiency, efforts should be made to provide training and support to ensure widespread adoption. Interaction quality is also crucial for the effectiveness of e-detailing. Diagnostic companies should ensure their platforms are user-friendly, offer engaging content, and enable real-time interaction and discussion (Dockendorf et al., 2021). Addressing physicians' queries promptly and providing personalized support can significantly influence their perception and adoption of e-detailing.

For the second item "E-detailing of in-vitro diagnostic tests suits my general needs better than face-to-face detailing", most of the respondents agreed with the statement, which is 255 or 62.50% of the respondents. Moreover, there are 97 who disagreed and 37 who strongly agreed.

E-detailing of in-vitro diagnostic tests can indeed suit the general needs of physicians better than face-to-face detailing. This is due to several factors, including convenience, time-saving, safety considerations, enhanced accessibility, technological advantages, engagement and interactivity, and documentation and reference. Convenience and flexibility are key advantages of e-detailing. Time-saving is another advantage, as physicians can access information about in-vitro diagnostic tests without having to allocate extra time for traveling to and from meetings. E-detailing sessions are more focused and efficient, enabling physicians to stay updated on the latest diagnostic tests and research in a shorter amount of time. Safety considerations are also important, especially during pandemics or infection control measures. E-detailing allows physicians to engage with representatives from diagnostic companies without risking exposure to infectious diseases, especially for immunocompromised patients or in high-risk areas. Enhanced accessibility is another advantage, as physicians can connect with representatives virtually, regardless of their geographical location. Technological advantages include real-time data sharing, interactive presentations, and instant messaging, enhancing the overall experience and understanding of complex diagnostic tests. E-detailing also provides an engaging and interactive experience for physicians, as representatives can use multimedia tools to effectively communicate complex concepts and features of diagnostic tests. Digital materials, such as brochures, white papers, and product information, can be easily stored and referenced for informed decision-making (Akbarieh et al., 2020).

On the other hand, there some physicians may argue that face-to-face detailing of in-vitro diagnostic tests is better due to several reasons. These include limited personal interaction, lack of customization, technical challenges, limited non-verbal communication, preference for tangible materials, and privacy and data security concerns (Ruben et al., 2021).

Direct interaction with medical representatives is essential for better understanding, clarification of doubts, and building professional relationships. E-detailing, which

typically occurs through digital channels, may be seen as impersonal and lacking in this aspect. Customization is also a concern, as medical representatives can adapt their approach based on individual preferences, clinical practice, and patient population. Technical challenges may also arise, as physicians may feel uncomfortable or less confident in navigating digital platforms or using electronic devices during the detailing process. Non-verbal cues, such as body language and facial expressions, play a crucial role in effective communication, and e-detailing may not capture these nuances, leading to potential misunderstandings or misinterpretations. Physicians who prefer physical materials may find e-detailing less satisfactory, as electronic presentations may not provide the same tactile experience or convenience. Privacy and data security concerns may also arise, as e-detailing often involves the exchange of medical information and patient data through digital platforms (Paul *et al.*, 2023).

For the third statement, “E-detailing fits my time management style than face-to-face detailing because it allows me to conduct longer and deeper research about in-vitro diagnostic tests”, there 297 respondents who agreed with this, while there are 68 who disagreed, and 38 strongly agreed. In the fourth statement “E-detailing suits my schedule because it enables me to access information about in-vitro diagnostic tests in my free time”, there are 292 physicians who agreed, while 86 strongly agreed, and 17 disagreed. This means that most of the respondents perceive that e-detailing is compatible with their time management style and schedule.

E-detailing in the in-vitro diagnostic (IVD) industry offers physicians numerous benefits, including extensive research opportunities, flexibility and convenience, self-paced learning, accessibility, and efficient time utilization. E-detailing allows physicians to explore comprehensive product information, scientific literature, clinical data, and case studies, providing a deeper understanding of diagnostic tests, their applications, and potential impact on patient care. Flexibility and convenience are also key advantages of e-detailing. E-detailing platforms allow physicians to access information about in-vitro diagnostic tests at their convenience, allowing them to manage their time effectively. They offer self-paced learning,

accessibility, and efficient time utilization. Physicians can integrate e-detailing into their schedules, engaging with content whenever needed. However, face-to-face interactions still hold value in complex discussions or hands-on demonstrations. Reliable internet connectivity and user-friendly platforms influence the overall experience and adoption of e-detailing.

In the last item “E-detailing will fit well with my work style”, most of the respondents agreed with the statement with 264 responses, with a percentage of 64.71%. There are 86 who answered “strongly agree”, while there are 55 and 3 respondents who answered “disagree” and “strongly disagree”, respectively. E-detailing in the in-vitro diagnostic (IVD) industry is influenced by factors such as flexibility, convenience, information access, interactive content, customization, and time efficiency. Physicians often have busy schedules and limited time for in-person meetings, which can hinder their workflow efficiency. E-detailing allows physicians to access relevant information from any location and time, enhancing their workflow efficiency. Information access is crucial for physicians, who constantly seek accurate information about diagnostic tests and technologies. E-detailing platforms provide a platform for IVD companies to share product details, clinical evidence, and research findings in a digital format, allowing physicians to access comprehensive information without the need for physical materials or face-to-face meetings. Interactive content, such as videos, animations, and multimedia presentations, can enhance physicians’ engagement and facilitate their understanding of complex IVD products. Customization and personalization can be achieved through user profiling and data analytics, ensuring that physicians receive relevant and valuable information. Time efficiency is another advantage of e-detailing. It eliminates the need for travel time associated with in-person meetings, allowing physicians to review product information and engage with e-detailing platforms efficiently. This time-saving aspect aligns well with physicians’ work style, enabling them to access information quickly and conveniently.

Perception of Physicians on the Complexity of E-detailing

Table 3: Perception of Physicians on the Complexity of E-detailing

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
I believe e-detailing is easy to use	48	320	32	8	408
I do not find any issues in accessing e-detailing tools	35	243	121	9	408
E-detailings tools are easy to navigate	47	307	44	10	408
Using e-detailing requires a lot of mental effort	6	55	296	51	408
Learning to use e-detailing is easy	53	337	18	0	408
Switching to e-detailing from face-to-face detailing will be	46	329	33	0	408

For the item “I believe e-detailing is easy to use”, most of the respondents agreed with this statement, with 320 counts or 78.43% of the respondents. There were 48

who strongly agreed, and 32 respondents who disagreed. Also, for the item “Learning to use e-detailing is easy”, there were 337 who responded “agree”, 53 who strongly

agreed, and 18 who disagreed. E-detailing is perceived as easy to use by doctors due to several factors. These include convenience, accessibility, flexibility, information availability, enhanced engagement, and tailored content. Convenience allows doctors to interact with pharmaceutical representatives without the need for in-person meetings or visits to their clinics. E-detailing platforms are designed to be user-friendly and accessible, providing a simple and intuitive interface for doctors to navigate and interact with features. Flexibility allows doctors to participate in e-detailing sessions from their own office or any other location with internet access, enhancing their perception of its usability. Information availability is another key factor, as e-detailing platforms provide doctors with easy access to a wealth of information about pharmaceutical products, treatment guidelines, clinical trials, and research findings. Interactive features, such as multimedia presentations, videos, and interactive tools, help doctors engage with the content more effectively, making the learning experience more enjoyable and memorable. Tailored content is another advantage of e-detailing platforms, as they can provide personalized information based on doctors' preferences, specialties, and patient populations. This makes it easier for doctors to understand and apply the information in their clinical decision-making process.

For the second item "I do not find any issues in accessing e-detailing tools", there are 243 respondents who answered "agree", 121 respondents who answered, "disagree", and 35 respondents who chose "strongly agree". Majority of the respondents do not find any issues in accessing e-detailing tools. Doctors may not find any significant issues in accessing e-detailing tools due to several factors. These include widespread internet connectivity, compatibility with multiple devices, user-friendly interfaces, cross-platform accessibility, minimal technical requirements, and adequate support and training.

Internet connectivity is widespread and easily accessible in many regions, ensuring seamless access to e-detailing tools. E-detailing platforms are designed to be compatible with various devices, allowing doctors to choose the device that suits their preference and convenience (Wolters Kluwer, 2020). User-friendly interfaces are often developed with user experience in mind, incorporating clear instructions, well-organized layouts, and intuitive controls. Cross-platform accessibility is another advantage of e-detailing platforms. Many are web-based or offer dedicated mobile apps, allowing doctors to access the tools across different operating systems. Minimal technical requirements make e-detailing tools accessible without the need for specialized hardware or software. Doctors can access e-detailing platforms using standard web browsers or downloading lightweight mobile apps. Additionally, e-detailing providers often offer support services and training resources to assist doctors in using their platforms effectively. These resources may include user guides, FAQs, video tutorials, and dedicated support

teams. The availability of comprehensive support and training ensures that doctors can quickly resolve potential issues and become proficient in using e-detailing tools.

In the third item "E-detailing tools are easy to navigate", majority of the respondents, which is 307 or 75.25% of the physicians, agreed that e-detailing is easy to use. There are 47 strongly agreed, and 44 disagreed with the statement. E-detailing tools are perceived as easy to navigate by doctors due to their intuitive user interface, familiarity with digital platforms, consistency in design, clear menu hierarchy, robust search and filtering capabilities, interactive and guided features, and iterative improvements. Intuitive user interfaces are organized, visually appealing, and provide clear navigation menus and options. Doctors, especially younger generations, are familiar with digital platforms and tools, making them easy to navigate (Lupton, 2021). Consistency in design, such as placement of menus, buttons, and content sections, makes it easier for doctors to navigate the platform. A clear menu hierarchy helps doctors navigate through different sections and content categories, logically grouped together. Search and filtering capabilities allow doctors to quickly find relevant content or resources using keywords or filters. Interactive and guided features, such as tooltips, pop-up guides, or interactive tutorials, make the navigation process more straightforward and reduce potential confusion. User feedback and iterative improvements are crucial for e-detailing platforms to maintain a user-friendly experience. Continuous improvements based on user feedback contribute to a more user-friendly experience and reinforce the perception that the tools are easy to navigate (Dwivedi *et al.*, 2021).

For the fourth item "Using e-detailing requires a lot of mental effort", 296 or 72.55% of the respondents disagreed, while there were 55 who agreed and 51 strongly disagreed. Thus, the majority of physicians disagree that e-detailing requires a lot of mental effort. E-detailing is often perceived as mentally effortless by doctors due to several factors. These include user-friendly interfaces, concise and targeted information, customization and personalization, interactive and engaging features, accessible and digestible format, convenient access, and familiarity with digital tools. E-detailing platforms are designed with user experience in mind, offering clear menus, organized layouts, and straightforward navigation. They focus on providing key points, summaries, and relevant data, reducing cognitive load and making the overall experience feel effortless. Customization allows doctors to personalize their experience based on their specialties, patient populations, or specific interests, ensuring they receive tailored information that aligns with their areas of focus. The accessible format of e-detailing tools uses clear language, bullet points, visuals, and other formatting techniques to enhance readability and comprehension.

Some doctors may also perceive e-detailing as mentally demanding due to several factors. Information overload

can lead to doctors feeling overwhelmed by the vast amount of information presented, requiring mental effort to filter and prioritize relevant information. Multitasking can increase mental load as doctors need to divide their attention and cognitive resources between different activities, including navigating the e-detailing platform. Cognitive processing is another significant challenge in e-detailing, as it involves complex medical concepts, scientific data, and technical information. This process requires concentration, critical thinking, and mental effort, especially when dealing with intricate or unfamiliar topics. Decision-making considerations can also be mentally taxing, as doctors need to consider patient-specific factors, clinical guidelines, drug interactions, and potential risks or benefits. Adaptation to technology can be challenging for doctors, as they may face challenges in navigating unfamiliar interfaces, features, or functionalities (Vaportzis *et al.*, 2017). The initial learning curve and the need to adapt to new ways of engaging with information can contribute to the belief that e-detailing requires mental effort. Time constraints also contribute to the perception of mental effort in using e-detailing, as doctors often have limited time available for professional activities, including e-detailing sessions.

In the last item, “Switching to e-detailing from face-to-face detailing will be easy”, most of the respondents agreed with 329 counts (80.64%). Moreover, there are 46 respondents who strongly agreed, and 33 who disagreed with the statement. Doctors may find switching to e-detailing easier due to several reasons, including convenience, improved access to information, time-saving, and perceived effectiveness of digital communication. The perceived effectiveness of digital communication is another aspect, as doctors are increasingly familiar with and reliant on digital communication methods in their personal and professional lives.

However, some doctors may initially encounter challenges while transitioning from face-to-face detailing to e-detailing, such as adapting to new technology, concerns about the quality and depth of interactions, and the need for additional training and support. Addressing these concerns through comprehensive training, ongoing support, and demonstrating the benefits of e-detailing can help facilitate a smoother transition and increase physicians’ confidence in embracing this digital approach in the in-vitro diagnostic industry.

Intention of Physicians to E-detailing

Table 4: Intention of Physicians to E-detailing

Items	Strongly Agree	Agree	Disagree	Strongly Disagree	Total
I consider to use e-detailing to get updates about in-vitro diagnostic tests	77	314	17	0	408
In the future I will use e-detailing regularly for getting information about in-vitro diagnostic tests	68	304	35	1	408
I intend to switch to e-detailing from face-to-face detailing	56	177	156	19	408
I intend to use e-detailing during the pandemic since face-to-face detailing is not possible	72	321	11	4	408
I intend to use e-detailing even after the pandemic	86	284	29	9	408

For the items in Table 4, most of the respondents have the intention to acquire information about new trends in the in-vitro diagnostic (IVD) industry using e-detailing. Most of the doctors intend to use e-detailing during the pandemic since face-to-face detailing is not possible. Also, physicians consider using e-detailing to get updates about in-vitro diagnostic tests, and in the future they will use e-detailing regularly for getting information about in-vitro diagnostic tests.

Doctors have several reasons to consider using e-detailing, particularly when it comes to acquiring information about new trends in the in-vitro diagnostic (IVD) industry and staying updated on in-vitro diagnostic tests. E-detailing provides doctors with a convenient way to access information about new trends and diagnostic tests. They can access the information from their computers, tablets, or mobile devices, allowing them to stay informed at their own convenience, regardless of their location or time constraints. This accessibility makes it easier for doctors

to acquire knowledge about the latest advancements in the IVD industry. The IVD industry is constantly evolving, with new diagnostic tests and technologies being introduced regularly. E-detailing platforms can provide doctors with real-time updates, ensuring that they stay up-to-date with the latest developments (Bigtincan Holdings Limited, 2023). By receiving timely updates, doctors can make well-informed decisions about adopting new diagnostic tests or technologies in their practice. Moreover, e-detailing platforms often offer comprehensive information about in-vitro diagnostic tests. These platforms can provide detailed product descriptions, clinical trial data, research findings, and comparative analyses of different tests, enabling doctors to gather all the necessary information in one place.

The COVID-19 pandemic has significantly disrupted traditional face-to-face interactions, including detailing sessions. E-detailing emerged as a viable alternative during the pandemic, allowing doctors to continue

acquiring information about new trends and diagnostic tests without compromising their safety or the safety of their patients.

For the item, “I intend to switch to e-detailing from face-to-face detailing”, a percentage of 43.38% of the respondents agreed while 38.24% disagreed with this statement. The nearly divided percentage of agreement and disagreement regarding the intention to switch from face-to-face detailing to e-detailing suggests that there are mixed opinions among the respondents.

Doctors have varying preferences when it comes to acquiring information and engaging with pharmaceutical representatives or industry experts. Some doctors may be more comfortable with face-to-face interactions, valuing direct communication, while others may be more open to embracing digital platforms and find e-detailing more convenient. These individual preferences can contribute to the divided percentage. The age and technological proficiency of the respondents may play a role in their agreement or disagreement with switching to e-detailing. Younger doctors who are more familiar with digital tools and have grown up in a technology-driven era may be more inclined to embrace e-detailing. In contrast, older doctors who are less comfortable with technology or have established routines and preferences for face-to-face interactions may be more resistant to the switch. This generational difference can contribute to the divided percentage. Respondents’ previous experiences with both face-to-face detailing and e-detailing can shape their

opinions. Some may have had positive experiences with face-to-face interactions, building trust and establishing relationships with pharmaceutical representatives. Others may have had negative experiences, finding them time-consuming or intrusive. Similarly, some respondents may have had positive experiences with e-detailing, appreciating the convenience and information accessibility, while others may have encountered limitations or perceived drawbacks.

These differing experiences and perceptions can contribute to the divided percentage. Regional or cultural factors can also influence the preference for face-to-face or digital interactions. Cultural norms, expectations, and communication styles can shape doctors’ attitudes toward e-detailing. In some regions or cultures, face-to-face interactions may be highly valued and considered essential for building professional relationships. These regional and cultural factors can contribute to the divided percentage among respondents.

To be able to examine if the physician’s perceptions to adapt e-detailing is influenced by the following socio-demographic characteristics, particularly, age, gender, years in practice, level in the medical hierarchy, the volume of laboratory requests written; and frequency of interacting with PSRs, a multiple linear regression model was formulated. The results are presented in Table 5.

Path Coefficients of Socio-Demographic Profile and Perceptions to Adapt E-Detailing

Table 5: Path Coefficients of Socio-Demographic Profile and Perceptions to Adapt e-detailing

	Estimate	SE	95%CI		t-stat	p-value
Ggender → Perception	-0.064	0.046	-0.154	0.035	-1.3913	0.164987
Age → Perception	-0.06	0.153	-0.397	0.246	-0.3922	0.695264
Years → Perception	-0.275	0.135	-0.532	0.043	-2.037	0.042298*
Ieve 1 → Perception	0.182	0.082	0.014	0.343	2.21951	0.027005*
Volume → Perception	-0.079	0.047	-0.156	0.027	-1.6809	0.093727
Frequency → Perception	-0.028	0.057	-0.138	0.092	-0.4912	0.623692

*Significant at 0.05

After analyzing the data through Structural Equation Modeling, the p-values for each independent variable obtained. The results revealed that the independent variables, the years of practice and the level in the medical hierarchy, had p-values of 0.042298, and 0.027005, respectively, which had less than 0.05. This indicates that the years of medical practice and level of medical hierarchy have statistically significant impact on physicians’ perception of adapting e-detailing. In other words, the physicians’ position or rank and years of experience within the medical field play roles in their likelihood of accepting or utilizing e-detailing methods. On the other hand, the p-values for all other independent variables, including gender, age, volume of laboratory requests written, and frequency of interacting with PSRs,

were greater than 0.05. This suggests that these variables were not found to have a significant association with the physicians’ perception of adapting e-detailing in this particular study.

Thus, these findings suggest that the years of medical practice and level of medical hierarchy is a crucial factor influencing physicians’ perception of adapting e-detailing. However, the other variables examined in the study, such as gender, age, the volume of laboratory requests written, and frequency of interacting with PSRs, did not demonstrate a significant relationship with the physicians’ perception of adapting e-detailing.

In the regression model, the factor “years of medical practice” was found to have a path coefficient of -0.275. In this case, the negative path coefficient of

-0.275 indicates a negative relationship between the years of medical practice and physicians' perception of adapting e-detailing. This means that as the number of years of medical practice increases, the likelihood of physicians perceiving e-detailing as beneficial decreases. Furthermore, the negative sign of the path coefficient suggests an inverse relationship between the two variables. It implies that physicians with more experience and a longer history of medical practice may be less inclined to embrace e-detailing as a valuable tool in their practice. There could be several reasons for this negative relationship. One possibility is that physicians with more years of practice may have established routines and ways of working that do not align with incorporating e-detailing into their clinical workflow. They may be comfortable with traditional methods of information acquisition and communication, and thus, may be hesitant to adopt new electronic methods (Farsi, 2021). Additionally, physicians with more experience may have developed a higher level of confidence and expertise in their field, leading them to rely less on external sources of information such as e-detailing. They may have established strong professional networks, access to specialized resources, and an extensive knowledge base, which reduces their perceived need for e-detailing. Furthermore, physicians with more years of practice may have experienced changes in the healthcare landscape over time. They may have witnessed the introduction of various technological innovations, some of which may not

have met their expectations or delivered the anticipated benefits. As a result, they may be more skeptical about the advantages of e-detailing based on their past experiences. In the regression model, the factor "level of medical hierarchy" was found to have a path coefficient of 0.182. The path coefficient of 0.182 indicates a positive relationship between the level of medical hierarchy and physicians' perception of adapting e-detailing. The positive sign suggests that as the level of medical hierarchy increases, the likelihood of physicians perceiving e-detailing as a valuable tool also increases. The magnitude of the path coefficient, which is 0.182 in this case, represents the extent of the relationship. Since the coefficient is positive but less than 1, it suggests a moderate positive association between the level of medical hierarchy and physicians' perception of adapting e-detailing. Therefore, based on the path coefficient of 0.182, it can be concluded that physicians in higher positions within the medical hierarchy are more likely to perceive e-detailing as beneficial. This finding underscores the importance of considering the influence of professional rank and authority within the healthcare system when implementing e-detailing strategies. Table 6 presents the results on the effects of the perception of the physicians influencing their behavioral intention to use e-detailing.

Path Coefficients of Perceptions to Adapt E-Detailing in their Intention of Adapting E-Detailing

Table 6: Path Coefficients of Perceptions to Adapt e-detailing in their Intention of Adapting E-detailing

	Estimate	SE	95%CI		t-score	p-value
Advantage → Intention	0.171	0.068	0.053	0.307	2.514706	0.0123*
Compatibility → Intention	0.31	0.056	0.187	0.412	5.535714	<0.00001*
Complexity → Intention	0.4	0.04	0.32	0.479	10	<0.00001*

*Significant at 0.05

In this study, a regression model using Structural Equation Modeling was developed to examine the factors influencing physicians' intentions to adopt e-detailing. There were three independent variables identified: perceptions of the advantage of e-detailing, perceptions of e-detailing compatibility, and perceptions of e-detailing complexity. These variables were considered important in understanding physicians' willingness to embrace e-detailing as a tool for their professional practices. To investigate the relationship between these variables and physicians' intention to adopt e-detailing, the path coefficients associated with each independent variable were analyzed. In this study, all three coefficients yielded p-values of 0.0123, <0.00001, and <0.00001, respectively. The small p-values in this study provide strong evidence against the null hypothesis, which suggests no relationship between the independent variables (perceptions of the advantage of e-detailing, perceptions of e-detailing compatibility, and perceptions of e-detailing complexity)

and physicians' intention to adapt e-detailing. Therefore, it can be concluded that there is a statistically significant relationship between these variables. These findings indicate that physicians who perceive e-detailing as advantageous, compatible with their professional needs, and less complex are more likely to express an intention to adopt this digital tool for their practice. In the regression model constructed, one of the independent variables examined was the perceptions of the advantage of e-detailing. The coefficient obtained for this variable was 0.171. A coefficient of 0.171 indicates a positive relationship between the perceptions of the advantages of e-detailing and the intention to adopt e-detailing. Specifically, for every one-unit increase in the perceptions of the advantage of e-detailing, the intention to adopt e-detailing is estimated to increase by 0.171 units, on average. This positive coefficient suggests that individuals who perceive e-detailing as more advantageous are more likely to express a stronger intention to adopt

e-detailing. These individuals recognize the benefits and value that e-detailing can bring to their specific context or situation, which influences their motivation and willingness to adopt this digital tool.

Another independent variable investigated was the perceptions of e-detailing compatibility. The coefficient obtained for this variable was 0.31. A coefficient of 0.31 indicates a positive relationship between the perceptions of e-detailing compatibility and the intention of adapting e-detailing. Specifically, for every one-unit increase in the perceptions of e-detailing compatibility, the intention to adapt e-detailing is estimated to increase by 0.31 units, on average. This positive coefficient suggests that individuals who perceive e-detailing as more compatible with their needs or professional requirements are more likely to express a stronger intention to adopt e-detailing. These individuals perceive e-detailing as fitting well into their existing practices or workflows, and they see it as a tool that complements and enhances their current ways of interacting with pharmaceutical companies or accessing information.

For the independent variable which was the perception of e-detailing complexity, the coefficient obtained for this variable was 0.4. A coefficient of 0.4 indicates a positive relationship between perceptions of e-detailing complexity and the intention to adopt e-detailing. Specifically, for every one-unit increase in perceptions of e-detailing complexity, the intention to adapt e-detailing is estimated to increase by 0.4 units, on average. This positive coefficient suggests that individuals who perceive e-detailing as less complex are more likely to express a stronger intention to adopt e-detailing. When individuals perceive e-detailing as simpler and easier to understand and use, they are more inclined to embrace it as a valuable

tool for their professional practices.

This study provided an in-depth analysis of the physician's perception of e-detailing and their intention to adopt the digital tool for their practice. The results indicated that physicians who viewed e-detailing as beneficial, suited to their professional requirements, and less complex were more likely to express a strong desire to adopt the technology. This positive sentiment indicates that physicians are aware of the advantages and value it can bring to their practices. They are aware that e-detailing has the potential to improve their communication and exchange of information with pharmaceutical companies, resulting in improved patient care and results. This positive sentiment encourages physicians to consider incorporating e-Detailing into their medical practice. Furthermore, it is essential for physicians to understand how the digital tool fits into their current practices and workflows, as when they perceive it as compatible, they are more likely to adopt it. The findings suggest that physicians who find e-detailing to be simpler are more likely to declare their intention to adopt it. This is likely due to the fact that simplicity and user-friendliness are essential components of physician decision-making. When e-detailing is perceived to be simple and straightforward, physicians are more likely to adopt it, as it does not require additional complexity in their busy professional lives (De Groot *et al.*, 2016). Moreover, when a digital tool is seen to be less complex, doctors are more likely to be confident in their capacity to use it effectively, thus increasing their willingness to use it.

Path Coefficients of Perceptions to Adapt E-Detailing in their Intention of Adapting E-detailing

Table 7: Path Coefficients of Perceptions to Adapt e-detailing in their Intention of Adapting E-detailing

	Estimate	SE	95%CI		t-score	p-value
Gnender → Intention	-0.034	0.051	-0.14	0.063	-0.66667	0.505151
Age → Intention	-0.001	0.144	-0.203	0.327	-0.00694	0.994418
Years → Intention	-0.259	0.142	-0.598	-0.017	-1.82394	0.068889
Ilevel → Intention	0.1 37	0.078	-0.067	0.266	1.75641	0.079774
Volume → Intention	-0.018	0.042	-0.094	0.071	-0.42857	0.668151
Frequency → Intention	0.108	0.056	-0.014	0.208	1.928571	0.054477

*Significant at 0.05

To be able to examine if the physician's intention to adapt e-detailing is influenced by the following socio-demographic characteristics, particularly, age, gender, years in medical practice, level in the medical hierarchy, the volume of laboratory requests written; and frequency of interacting with PSRs, a multiple linear regression model was formulated. The path coefficients are shown in Table 7.

After performing the regression analysis, all of the independent variables' coefficients had p-values above 0.05. A p-value above 0.05 indicates that the relationship between independent variables and intention to adjust

e-detailing was not statistically significant. All of the independent variables in the model did not appear to have a significant effect on the intention of the medical practitioners to change their e-detailing habits. Age, years of practice, medical hierarchy, number of lab requests, and the frequency of interactions with PSRs did not play a significant role on the intention of physicians about e-detailing. These results may indicate that other factors, such as their perception of e-detailing advantages, compatibility, and complexity could play a more significant role in influencing the intention to change the habits of medical practitioners.

Based on the provided path coefficients, the impact of each independent variable on the physicians' intention to adapt e-detailing is provided below.

For gender, the negative coefficient of -0.034 suggests that being female is associated with a slightly lower intention to adopt e-detailing. However, since the coefficient is small, its practical significance may be limited. For age, the negative coefficient of -0.001 indicates that increasing age is minimally associated with a lower intention to adopt e-detailing. However, the coefficient is close to zero, suggesting that age is not a substantial factor influencing the intention. For the years of medical practice, the negative coefficient of -0.259 implies that a longer duration of medical practice is associated with a lower intention to adopt e-detailing. This finding implies that more experienced physicians may be less inclined to adopt e-detailing as a promotional tool. For the level of medical hierarchy, the positive coefficient with a value of

0.137 indicates that a higher level of medical hierarchy is associated with a slightly higher intention to adopt e-detailing. This suggests that physicians in more senior positions may be more open to using e-detailing in their practice.

The negative coefficient of the volume of laboratory requests, which is -0.018, signifies that a higher volume of laboratory requests is associated with a slightly lower intention to adapt e-detailing. This finding may indicate that physicians who frequently request laboratory tests have a reduced interest in adopting e-detailing. The path coefficient of frequency of interacting with PSRs is 0.108 which is a positive coefficient. This indicates that a higher frequency of interacting with pharmaceutical sales representatives (PSRs) is associated with a slightly higher intention to adapt e-detailing. This implies that physicians who frequently engage with PSRs may be more willing to embrace e-detailing as a promotional method.

Count of Most Preferred Method of Communication Regarding new IVD Tests

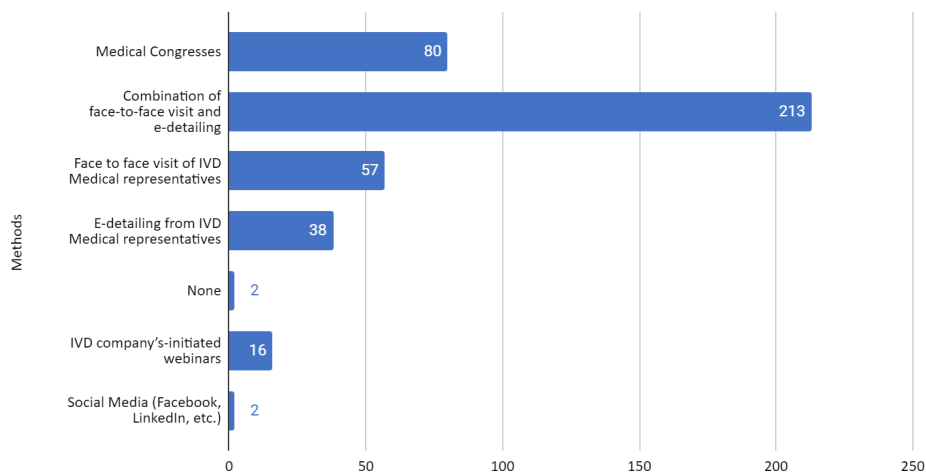


Figure 1: Most Preferred Method of Communication Regarding New IVD Tests

Filipino physicians use a variety of communication tools to acquire knowledge about in-vitro diagnostic tests. In this study, a thematic analysis was conducted to identify the key themes in identifying the preferred methods of communication regarding new IVD tests. The themes identified are medical congresses, a combination of face-to-face visits and e-detailing, face-to-face visits of IVD medical representatives, e-detailing from IVD medical representatives, IVD company's initiated webinars, social media, and none.

A common method mentioned by the respondents is attending medical congresses, with 80 individuals indicating its use. Medical congresses provide physicians with opportunities to learn about the latest developments in their field, including advancements in diagnostic tests (Hraden & Laidlaw, 2020).

A significant number of physicians, which is 213 or 52.21% of the respondents, reported using a combination of face-to-face visits and e-detailing. This is the most preferred method of communication regarding new IVD tests. This

approach allows them to have direct interactions with medical representatives while also receiving electronic information and updates about in-vitro diagnostic tests. Physicians often prefer a combination of face-to-face visits and e-detailing as a means to acquire knowledge about in-vitro diagnostic tests. This approach offers several clear reasons that resonate with their professional needs and preferences. Face-to-face visits provide physicians with the opportunity for direct interaction with IVD (in-vitro diagnostic) medical representatives. These representatives are experts in the field and are able to provide detailed explanations, answer questions, and address any concerns that physicians may have. Face-to-face visits allow for a personalized and tailored approach to information sharing, enabling physicians to engage in meaningful discussions and gain a deeper understanding of the diagnostic tests. Moreover, e-detailing offers the convenience of accessing information at any time and from any location. Physicians have busy schedules and limited time for additional activities, making it challenging

to attend all the necessary meetings and events. E-detailing provides a flexible solution by allowing physicians to review materials, presentations, and updates related to in-vitro diagnostic tests at their own pace. This enables them to efficiently manage their time and integrate learning into their daily routines.

The combination of face-to-face visits and e-detailing combines the advantages of both approaches. Physicians can benefit from the personal touch and expertise of the medical representatives during face-to-face interactions, while also having the convenience of accessing electronic resources for further reference and review. It allows for a more comprehensive learning experience that caters to different learning styles and preferences. Additionally, this combination approach promotes a deeper and more lasting retention of information. By engaging in face-to-face discussions and interactions, physicians can ask questions, seek clarification, and engage in interactive learning. This active participation enhances their understanding and retention of the knowledge acquired. The subsequent use of e-detailing materials serves as a valuable resource for reinforcing and revisiting the information, ensuring that it is retained and applied effectively in clinical practice. Furthermore, the combination of face-to-face visits and e-detailing allows for ongoing support and updates. Medical representatives can follow up with physicians after the initial visit, provide additional information, and address any new developments or concerns. The electronic resources shared through e-detailing enable physicians to stay updated on the latest advancements and changes in the field, ensuring that their knowledge remains current and relevant.

A smaller group of physicians, 57 in total, mentioned that they rely on face-to-face visits from IVD (in-vitro diagnostic) medical representatives. These representatives provide detailed information about diagnostic tests and their applications, allowing physicians to stay informed and make informed decisions. Another group of physicians, comprising 38 individuals, mentioned e-detailing as their preferred method of acquiring knowledge about in-vitro diagnostic tests. E-detailing involves receiving electronic presentations or materials from IVD medical representatives, providing physicians with the convenience of accessing information at their own pace. Two respondents indicated that they do not use any specific communication tools to acquire knowledge about in-vitro diagnostic tests. This suggests that there may be a portion of physicians who rely on other sources or have different preferences when it comes to staying informed about diagnostic tests. In terms of more recent trends, 16 respondents mentioned that they rely on webinars initiated by IVD companies to acquire knowledge. Webinars provide a convenient platform for physicians to access educational content remotely and interact with experts in the field. Lastly, two respondents mentioned social media as a communication tool for acquiring knowledge about in-vitro diagnostic tests. Social media platforms can serve as a source of information and

allow physicians to connect with experts, share insights, and stay updated on the latest developments in the field. In general, Filipino physicians use a variety of communication strategies, such as medical congresses, in-person visits, e-learning, webinars, and social media to gain knowledge regarding in vitro diagnostic tests. These strategies provide various learning opportunities, enabling physicians to remain informed and better serve their patients.

CONCLUSION

The development of e-diagnostic practices in the in vitro diagnostic sector in the Philippines is affected by a variety of elements, which are outlined in detail in the thesis. The results of this study provide insight into the primary factors that influence the decision-making process of physicians when it comes to e-diagnostic procedures. An important factor to consider is the perceived advantages of e-detailing. When physicians perceive e-detailing tools to be beneficial to their practice, to improve patient care, to provide pertinent and timely information on in vitro diagnostic products, they are more likely and more likely to adopt e-detailing techniques. This emphasizes the importance of demonstrating the practical advantages of e-detailing methods to physicians to promote their adaptation. Physicians are more likely to opt for e-detailing if it is perceived to be compatible or is in line with their professional principles, values, and preferences. Another factor is its complexity. Physician adoption of e-diagnostics is more likely to occur when it is perceived to be intuitive, straightforward, and in line with the physician's current workflow. Many doctors intend to adapt e-detailing due to these factors. It is essential to understand and address these elements in order to foster the adoption and deployment of e-diagnostics in the in vitro diagnostic sector in the Philippines, thus resulting in enhanced healthcare outcomes and industry progress. By acknowledging the significance of the perceived advantages, compatibility and complexity of e-detailing methods, stakeholders can create tailored strategies to motivate physicians to adopt these.

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