

Accountable Care Organization: Is It Early Approach in Saudi Arabia?

Abeer M. Alharbi¹, Ghaliah A. Nassar¹, Mariam Alerwi¹, Amjad S. Aljelban¹,
Ahmed Alslaihim¹, Bander Alshehri¹, Anwar Alenezi¹, Salem Alsuwaidan^{2*}

¹Family Medicine Academy Department, King Saud Medical City, Ministry of Health, Riyadh, KSA

²Research and Innovation Center, King Saud Medical City, Ministry of Health, Riyadh, KSA

Email: *sa.alsuwaidan@ksmc.med.sa

How to cite this paper: Alharbi, A. M., Nassar, G. A., Alerwi, M., Aljelban, A. S., Alslaihim, A., Alshehri, B., Alenezi, A., & Alsuwaidan, S. (2022). Accountable Care Organization: Is It Early Approach in Saudi Arabia? *American Journal of Industrial and Business Management*, 12, 1708-1723.
<https://doi.org/10.4236/ajibm.2022.1211094>

Received: October 2, 2022

Accepted: November 27, 2022

Published: November 30, 2022

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Abstract

Accountable Care Organization (ACO) is trying to evolve all around the world moving towards and keeping cost-effective at a minimum, providing a better quality of care and improving health outcomes in a patient-centered manner, adopting technology to organize and coordinate care between health care network, primary health care and hospitals to facilitate care and management, monitoring, and reporting quality and cost data to track patient across health care providers by allowing access to patient electronic medical file, and avoiding duplication of services and prevent medical errors. **Objectives and Aims:** The main objectives of this study is to find out the association of demographic data and the level of knowledge, attitude and confidence of the physicians of various age, gender, specialty, area of work and their clinical and administrative field experiences. This is to assess the ability to establish a successful basement to build a new trend in healthcare system “Accountable Care Organizations” (ACOs) in Saudi Arabia. **Results:** This prospective and cross-sectional study was conducted on 321 physicians with an average age of 42.8 ± 11 SD. Results showed the average score for knowledge of all respondents was 65.2 out of 100 with ± 15.7 SD. The overall average of the modes of the attitude was 6.8 out of 10; While the overall average of the modes of the confidence was 5.9 out of 10. **Conclusion:** This study was conducted to assess physicians’ knowledge, attitude and confidence toward implementation of ACO in Saudi Arabia. The current study suggested that there was no significant difference between the level of knowledge of ACOs between males and females and between the specialties (consultant, specialist, or resident). Results showed that there was no significant difference in attitude between males and females neither there was a significant difference between different specialties consultants, specialists and residents. Moreover, those physicians with administrative experience had better attitudes towards

ACO than those with clinical experience. Males showed higher confidence compared with females. There were similarities in results with no significant changes between consultants, specialists and residents with predominantly average mode of what is considered as moderate confidence. This study is confirming that Saudi Arabia is ready for the transformation and vision of 2030 to adopt the ACO health care system with this knowledge, attitude and confidence of the Saudi physicians.

Keywords

Accountable Care Organization (ACO), National Transformation Program (NTP), Saudi Vision 2030, Primary Healthcare Center (PHC), Health Clusters, Knowledge, Attitude and Confidence (KAC)

1. Introduction

The new trend in health care system is trying to evolve all around the world moving towards and keeping cost-effective at a minimum, providing a better quality of care and improving health outcomes in a patient-centered manner, which used to be known as a triple aim (McClellan et al., 2010). Accountable Care Organization (ACO) is one of the important systems to reform the health care system, which was first piloted by the United States and many countries, and is now being adopted by the Kingdom of Saudi Arabia. The ACO differs and varies in their application and definition to put it as simply as possible and in a unified matter; however, ACO is basically defined as “a group of providers to be jointly accountable for achieving a set of outcomes for a prospectively defined population over a period of time and for agreed cost” (McClellan et al., 2014).

The Kingdom of Saudi Arabia (KSA) Healthcare system is trying to adopt new ideas to provide a new model for the healthcare system to provide joint accountable organization in the national plan of 2030 vision. The 2030 vision of the KSA strategies was held to achieve long-term outcomes in the country customized to its needs and potential approach, which was built on three main agendas concluded in a better economy, better health care and an ambitious society. As part of 2030 vision goals in healthcare system transformation, which is led by the Ministry of Health (MOH), the national organization responsible for healthcare of Saudi Arabian citizens, along with collaboration with one of the executive programs of 2030 vision which is the National Transformation Program (NHP). The healthcare system transformation process begins by dividing regions into clusters according to their own facilities, data, and responsibility to provide value-based healthcare services (Vision2030.gov.sa, Healthcare-Transformation-Strategy).

The Kingdom of Saudi Arabia's healthcare system has limited experience but efforts are made in moving towards accountable care organizations models as it is in the piloting stage, fairly new to see outcomes yet. Some primary healthcare

centers had been initiated and started partially applying in clinics such as chronic disease, well-baby clinics, and maternity clinics. Primary healthcare and family physicians are essential roles and elements for an accountable care organization to succeed (Bobbitt, 2011).

ACOs had been applied in the United States for years, and offered one of prime examples of a successful approach. An organization called The American Association for Physician Leadership, which is the oldest and largest medical association in the US, focused on training and educating physicians on better leadership skills. In order to apply for a successful ACO, it is believed that the key factor is to be led by physicians who are active, and have a full frame picture in taking initiation and decision (Kaplan et al., 2012). The healthcare systems are changing constantly, but the demand for physicians with good skills that could be able to cope with the changes and be engaged in administrative decisions is crucial (Schwartz & Pogge, 2000). Physicians' insight and prospective is essential for successful ACOs as they deliver the healthcare and make the decisions which should affect positively for the sake of patient's outcomes.

Advantages of ACOs led by physicians to non-clinical oriented leaders, is that physicians have better insight and knowledge of what goes on in patient care as they work on the frontlines. Physician have better understanding and can predict how a clinical decision can affect the outcome and quality of care, hence physicians have better advantage in negotiating and advising with or against healthcare services (Porter & Teisberg, 2007).

One fundamental goal of ACOs is that they will improve the health and wellness of a defined population for which the ACO is accountable. This goal is promoted by increasing the emphasis on preventive care provided by primary care services, and coordinating services across levels of care. Healthcare organizations that participate in ACOs receive incentives for meeting quality standards of care while at the same time lowering growth in healthcare costs (Ortiz et al., 2013).

Adopting technology to organized and coordinate care between health care network, primary health care and hospitals to facilitate care and management, monitoring, and reporting quality and cost data to track patient across health care providers by allowing access to patient electronic medical file, avoiding duplication of services and prevent medical errors.

Implementing ACO model needs the following four steps:

- 1) Create global teamwork, which have the efficiency to work on one commitment and with integrating clinical practice.
- 2) Create a cost saving system characterized with enhancement of increasing financial incentive.
- 3) Improve quality control with best practice.
- 4) Ability to measure the key performance indicator (KPI).

However, there are challenges with accountable Care Organizations which include the lack of how should be implemented. ACO leaders will also need to decide how to distribute shared savings fairly should savings be shared with clini-

cians? Equally, or based on performance? (DeCamp et al., 2014). Significant challenges face primary-care physicians who join an ACO such as acquiring a robust Electronic Health Record system with advanced reporting, disease registries, and patient's care management (Moy et al., 2021; King et al., 2016).

Evaluating knowledge, attitude and confidence of physician in ACOs recorded will have better positive attitude and give future vision toward ACOs settings (Staloff et al., 2019). The benefit of increasing physicians' awareness about ACOs processes reflected improved the quality of healthcare services and reducing financial aspects. Joining ACOs processes may facilitate a positive perception and prevent barriers (Wan et al., 2014a). Participation of physicians in the ACOs features (including regulation, risks, measuring quality) showed that most physicians have attributed the lack of knowledge and insufficient attitude due to limited experience with ACOs, financial issues, physician attitudes, market dynamics, and patient's preferences (Powell et al., 2016). A higher degree of willingness for ACO joining showed among health care personnel who were more knowledgeable about ACOs (Lin et al., 2018). A significant association was found between the level of knowledge and willingness to join ACO (Wan et al., 2014b). Additionally, ACO had a positive impact on the physicians' ability to meet the needs and improve the care services (Moysychyn, 2016).

Implementation of ACO should have all the criteria to establish it and in the meantime should avoid all the resistant elements to build up a new model in health care system. In addition, the main element in building up the manpower system of the family physicians by increase their knowledge and attitude and to focus on support them with proper education and encouraging physicians participation in decision-making process, for a better application of Accountable Care organizations and improving Healthcare System in Saudi Arabia.

2. Objectives and Aims

The main objectives of this study is to find out the association of demographic data and the level of knowledge, attitude and confidence of the physicians in various age, gender, specialty, area of work and their clinical and administrative field experiences. This is to assess the ability to establish successful basement to build a new trend in healthcare system "Accountable Care Organizations" (ACOs) in Saudi Arabia.

3. Methods

This is a cross-sectional observational analytic study. A survey was distributed through all known media, assessing three major aspects: knowledge, attitude and confidence of the physicians in Hospitals and Primary healthcare centers in Saudi Arabia including; Ministry of Health, government and private sectors. This survey was consisted four main sections:

- 1) Demographic data, which include the followings:
 - a) Age and gender

- b) Specialty
- c) Area of work in the KSA
- d) Clinical experience
- e) Administrative experience
- 2) Measuring physician's knowledge

Knowledge was evaluated through certain multiple choice questions that physician should answer to determine their knowledge by giving a score out of 100 to evaluate every participants. These questions were include about the accuracy of describing ACO, fee-free services paid basis by ACO, ability of healthcare professional to participate in an ACO, and quality measures used in an ACO.

- 3) Measuring physician's attitude

Physician's attitude was also evaluated through another multiple choice questions including availability of time spend with the patients, improve the overall healthcare system, job satisfaction, quality measures of provided care to the patients and cost in ACO-based payment.

- 4) Measuring physician's confidence

Self-assurance expressed and evaluated as physician's confidence through multiple choice questions regarding data reporting about the population's health and healthcare utilization and identify its actionable insight, agreements of care coordination, provide high quality care to the patients with minimal cost, reduce unnecessary hospitalizations, success in sharing savings or risk-based contract, and manage patient's care between healthcare settings.

According to the response of the participants, there will be evaluation for knowledge as out of 100% as summation of score for each answer, and each participants will be evaluated individually according to their answer for the questions related to the knowledge part. Summation of score for each answer will also be applied for the attitude and confidence and also each participants will be evaluated individually according to their answer for the questions, however the total score will have 10 out of 10 for attitude and confidence.

3.1. Statistical Consideration

Data will be in the format of table and will be entered into the SPSS statistical package. The data that will be collected and analyzed to provide an idea about knowledge, attitude and confidence toward implementing Accountable Care Organizations in Saudi Arabia to be applied in the Ministry of Health as a new trend in healthcare system. Descriptive statistics will be presented as numbers and percentages and T-test, or ANOVA to compare between the means for each group or chi-square test were implemented whenever it is needed.

3.2. Ethical Consideration

No personal data will be utilized for other than this study although it should not impose any harm or risk for the participants. Ethical approval was granted with a proposal reference No.: H1RI-11-Jul21-01 from the institutional review board

of the King Saud Medical City.

4. Results

This is a prospective, cross-sectional study was conducted on 321 respondents; all of them were physician with average age of 42.8 (± 11 SD). The respondents were 163 females (50.8%) and 158 male (49.2%); the consultants were 147 (45.8%), specialists 82 (25.5%) and residents with 99 (30.8%). Those who had 10 years as experience in clinical field were 147 respondents (45.8%) and only 39 respondents (12.1%) were having more than 10 years in administrative filed experience. Most of the respondents were from Riyadh with 145 respondents (45.2%), then Abha and Jazan with 44 respondents (13.7%). Results showed that respondents were working at the MOH with 147 respondents (45.8%), and those who are working at private hospitals were 33 respondents (10.3%) as it is summarized in **Table 1**.

4.1. Knowledge

Knowledge about ACO can be evaluated if the respondents answered the correct choice for four multiple choices including 1) accurately describes an Accountable Care Organization (ACO)?” as a group of doctors, hospitals, and other health care providers who give coordinated high quality care to their patients; 2) An ACO that is paid on a fee-for-service basis with an opportunity to share in savings based on their financial and quality performance, but is not financially

Table 1. The average results (\pm standard deviation) for knowledge, attitude, and confidence for all respondents; then a comparative data for male and female from one side and consultant, specialist and resident to be compared with all respondents.

Descriptive Statistics	All (n = 321)	Male (n = 158)	Female (n = 163)	Consultant (n = 140)	Specialist (n = 82)	Residents (n = 99)
Age	42.8 (11)	43.02 (11)	42.6 (11)	51.8 (5)	44.72 (7)	28.51 (2.8)
Knowledge	65.2 (15.7)	65.87 (16.4)	64.56 (15)	65.4 (15.7)	62.84 (16.5)	66.88 (14.8)
Overall_Improv_attit	6.25 (2)	6.35 (2)	6.15 (2)	5.73 (1.8)	6.44 (1.9)	6.83 (2.2)
Time_Spent_attitude	7.28 (2)	7.42 (1.8)	7.15 (2.1)	7.96 (1.5)	7.43 (1.9)	6.21 (2.1)
Overall_Jb_sat_attit	6.47 (2.5)	6.79 (2.4)	6.17 (2.6)	6.66 (2.5)	6.12 (2.7)	6.49 (2.4)
Attitude_Focus_ACO	6.62 (2.3)	6.82 (2.2)	6.43 (2.4)	6.61 (2.5)	6.51 (2.2)	6.74 (2)
Correl_Qlty_attitude	5.82 (2.4)	5.85 (2.4)	5.79 (2.5)	5.39 (2.6)	5.66 (2.3)	6.57 (2.2)
Data_report	6.06 (2.2)	6.56 (2.1)	5.58 (2.2)	5.94 (2.3)	6.17 (2.1)	6.14 (2.1)
Actionable	5.97 (2.2)	6.21 (2)	5.73 (2.3)	5.96 (2.3)	6.02 (2.1)	5.93 (2.1)
Beneficial	6.03 (2.3)	6.2 (2.2)	5.87 (2.3)	5.83 (2.5)	6.1 (2.2)	6.25 (2)
Hi_Qlt_Lo	6.17 (2.4)	6.03 (2.5)	6.31 (2.4)	5.99 (2.6)	6.23 (2.2)	6.36 (2.3)
No_Hospital	6.19 (2.4)	6.28 (2.4)	6.1 (2.4)	5.95 (2.6)	6 (2.4)	6.69 (2.1)
Shared_save	6.17 (2.3)	6.47 (2.3)	5.88 (2.3)	6.03 (2.5)	6.37 (2.2)	6.21 (2.2)
Transitional	5.88 (2.3)	6.13 (2.2)	5.65 (2.4)	5.66 (2.3)	5.68 (2.4)	6.37 (2.2)

responsible for any potential losses?"; 3) All healthcare professionals are able to participate in an ACO?" 4) To assure a quality measure used in Medicare's ACO programs?

The main concern of this study was how to evaluate knowledge of the participants about ACO. Knowledge had been evaluated according to the respondents answers and giving a score for every respondent. Summation of the scores for the answers would be given the weight defined as the percentage of knowledge of the participants (out of 100). Results showed the average score for knowledge of all respondents was 65.2 (out of 100) with (± 15.7 SD). Subsequent results showed that 138 (43%) of the respondents were answered correct for the description of ACO; 97 (30.2%) were answered correct for the ACO payment arrangement; 69 (12.5%) were answered correct for all healthcare professionals' ability to participate in ACO, and finally only 59 (18.4%) of the respondents having a correct answer regarding the quality measure used in Medicare's ACO as shown in **Tables 2-5**.

Knowledge has been categorized to be excellent for those who scored 90 and more, good for 70 - 89, fair for 50 - 69 and poor knowledge for those who scored 49 and below. Results showed that 49 respondents (15.3%) were with excellent knowledge about ACO, 126 (39.3%) were with good knowledge, 116 (36.1) with fair knowledge and only 30 (9.3%) were with poor knowledge. Almost 43% with 21 consultants were having excellent knowledge about ACO, 36.7% with 18

Table 2. The average results (\pm standard deviation) for knowledge, attitude, and confidence for all respondents; then a comparative data for clinical field experience and administrative field experience.

Descriptive Statistics	All (n = 321)	Clinical field experience			Administrative field experience		
		<5 yrs (n = 80)	>5 yrs (n = 94)	>10 yrs (n = 147)	<5 yrs (n = 80)	>5 yrs (n = 94)	>10 yrs (n = 147)
Age	42.8 (11)	29.11 (4)	40.82 (9.2)	51.53 (5.4)	28.71 (3.1)	48.3 (8.4)	52.95 (6.2)
Knowledge	65.2 (15.7)	66.91 (14.5)	64.88 (16.9)	64.48 (15.5)	67.22 (15.3)	64.1 (15.8)	66.51 (14.1)
Overall_Improv_attit	6.25 (2)	7.07 (2.1)	6.46 (2.1)	5.67 (1.7)	7.09 (2)	5.88 (1.9)	5.9 (2)
Time_Spent_attitude	7.28 (2)	6.29 (2.2)	7.2 (1.9)	7.88 (1.7)	6.38 (2.5)	7.79 (1.6)	8.1 (1.5)
Overall_Jb_sat_attit	6.47 (2.5)	6.6 (2.3)	6.63 (2.5)	6.31 (2.7)	6.84 (2.3)	6.39 (2.4)	6.26 (2.8)
attitude_Focus_ACO	6.62 (2.3)	6.68 (2)	6.77 (2.2)	6.5 (2.5)	6.84 (2.1)	6.48 (2.5)	6.95 (2.2)
Correl_Qlty_attitude	5.82 (2.4)	6.45 (2.2)	6 (2.5)	5.36 (2.4)	6.93 (2.1)	5.74 (2.5)	5.23 (2.6)
Data_report	6.06 (2.2)	6.44 (2)	6.2 (2.1)	5.76 (2.3)	6.29 (2)	6.05 (2.1)	5.46 (2.4)
Actionable	5.97 (2.2)	6.28 (1.9)	6.1 (2.2)	5.71 (2.3)	6.27 (2)	5.93 (2.3)	5.82 (2.4)
Beneficial	6.03 (2.3)	6.49 (2)	6.07 (2.2)	5.75 (2.5)	6.71 (1.9)	5.81 (2.5)	5.85 (2.5)
Hi_Qlt_Lo	6.17 (2.4)	6.76 (2.1)	6.29 (2)	5.77 (2.7)	6.6 (2)	6.02 (2.6)	6.1 (2.8)
No_Hospital	6.19 (2.4)	6.71 (2.2)	6.47 (2.3)	5.73 (2.5)	6.64 (2.3)	5.84 (2.6)	5.85 (2.36)
Shared_save	6.17 (2.3)	6.41 (2.1)	6.18 (2.4)	6.03 (2.4)	6.25 (2.2)	6.17 (2.3)	6.18 (2.7)
Transitional	5.88 (2.3)	6.6 (1.9)	5.99 (2.2)	5.43 (2.5)	6.6 (2.1)	6.01 (2.4)	5.05 (2.6)

Table 3. The average results (\pm standard deviation) for knowledge, attitude, and confidence for all respondents; then a comparative data according to the area at the KSA.

Descriptive Statistics	All (n = 321)	Riyadh (n = 145)	Jeddah (n = 34)	Dammam (n = 26)	Abha +Jezan (n = 44)	Mak_Mad (n = 34)	Others (n = 38)
Age	42.8 (11)	37.29 (11.4)	49.53 (5)	46.5 (9.3)	42.8 (11.1)	49.68 (7.6)	49.18 (6.9)
Knowledge	65.2 (15.7)	67.15 (15.2)	57.47 (14.4)	63.65 (14.6)	61.39 (19)	70.18 (14.7)	65.71 (13.2)
Overall_Improv_attit	6.25 (2)	6.42 (2.2)	5.91 (1.8)	6.54 (1.9)	6.02 (1.9)	6.03 (1.7)	6.16 (1.6)
Time_Spent_attitude	7.28 (2)	6.84 (2.1)	8.09 (1.3)	7.69 (1.7)	7.73 (1.5)	7.32 (2.4)	7.42 (1.6)
Overall_Jb_sat_attit	6.47 (2.5)	6.57 (2.5)	5.85 (2.8)	6.62 (2.6)	6.82 (2.5)	6.41 (2.5)	6.21 (2.6)
Attitude_Focus_ACO	6.62 (2.3)	6.79 (2.2)	6.15 (2.2)	6.19 (2.6)	7.2 (2.3)	6.44 (2.1)	6.21 (2.5)
Correl_Qlty_attitude	5.82 (2.4)	6.17 (2.6)	6 (2.3)	5.65 (2.2)	5.93 (2.4)	4.97 (2.3)	5.05 (2.2)
Data_report	6.06 (2.2)	6.24 (2.2)	6.47 (2.2)	5.15 (1.9)	6.2 (1.9)	5.47 (2.1)	5.97 (2.6)
Actionable	5.97 (2.2)	6.01 (2.1)	6.44 (2)	6.15 (2)	5.8 (2.4)	5.47 (2.4)	5.87 (2.1)
Beneficial	6.03 (2.3)	6.26 (2.2)	6.12 (2.2)	5.15 (2.5)	6.05 (2)	6.53 (2.7)	5.18 (2.3)
Hi_Qlt_Lo	6.17 (2.4)	6.26 (2.4)	6.35 (2.4)	5.69 (2.4)	6 (2.5)	6.32 (2.4)	6.03 (2.2)
No_Hospital	6.19 (2.4)	6.59 (2.3)	5.91 (2.7)	5.69 (2.4)	6.07 (2.6)	5.38 (2.5)	6.11 (2)
Shared_save	6.17 (2.3)	6.2 (2.4)	6.32 (2.3)	6.46 (2.2)	6.18 (2.3)	5.5 (2.2)	6.32 (2.5)
Transitional	5.88 (2.3)	6.14 (2.4)	5.62 (2.2)	6.19 (2.6)	5.68 (1.9)	5.79 (2.6)	5.24 (2.3)

Abha and Jezan considered the southern part of Saudi Arabia; Mak_Mad (Makkah and Madinah) were mixed, having the same environment; Others (including Qaseem, Hail and Tabouk) also having the same environment.

Table 4. The average results (\pm standard deviation) for knowledge, attitude, and confidence for all respondents; then a comparative data according to the workplace.

Descriptive Statistics	All (n = 321)	MOH Riyadh	MOH Western	MOH Eastern	Government hospitals	Private hospital
Age	42.8 (11)	32.89 (9.2)	45.16 (8.5)	46.95 (8.2)	36.17 (9.4)	37.39 (10.1)
Knowledge	65.2 (15.7)	67.91 (15.2)	62 (17.2)	64.6 (13.4)	68.67 (15.9)	64.91 (15.8)
Overall_Improv_attit	6.25 (2)	6.76 (2.3)	6.84 (1.9)	6.5 (1.5)	6.56 (1.7)	6.3 (2.2)
Time_Spent_attitude	7.28 (2)	6.34 (2.2)	7.74 (1.2)	7.05 (1.8)	6.83 (1.5)	6.61 (1.9)
Overall_Jb_sat_attit	6.47 (2.5)	6.54 (2.5)	6.97 (2.4)	6.35 (2.3)	7.33 (1.5)	6.48 (2.3)
attitude_Focus_ACO	6.62 (2.3)	6.72 (2)	7.06 (2.3)	6.05 (2.2)	7.17 (1.4)	6.58 (2.3)
Correl_Qlty_attitude	5.82 (2.4)	6.31 (2.4)	6.65 (2.4)	5.4 (1.5)	6 (2.1)	6.06 (2)
Data_report	6.06 (2.2)	6.23 (2.3)	6.29 (2.2)	6.25 (1.4)	6.56 (1.9)	6.21 (1.7)
Actionable	5.97 (2.2)	5.98 (2.1)	6.45 (2.1)	6.35 (1.9)	6.5 (1.8)	5.7 (2.2)
Beneficial	6.03 (2.3)	6.41 (2)	6.26 (2.3)	5.05 (2.3)	6.33 (2.2)	5.82 (2)
Hi_Qlt_Lo	6.17 (2.4)	6.47 (2.4)	6.06 (2.4)	6.9 (1.8)	6.67 (1.5)	6.3 (1.6)
No_Hospital	6.19 (2.4)	6.86 (2)	6.45 (2.5)	5.4 (2.1)	6.94 (2)	6.64 (2.1)
Shared_save	6.17 (2.3)	6.21 (2.4)	6.23 (2.2)	6.15 (2.2)	7.06 (1.9)	5.97 (2.2)
Transitional	5.88 (2.3)	6.46 (2.3)	6.1 (2.2)	5.9 (2)	6.17 (1.8)	6.03 (1.6)

Table 5. The average results (\pm standard deviation) for knowledge, attitude, and confidence for all respondents; then a comparative data according to the specialty of the respondents.

Descriptive Statistics	All (n = 321)	Family medicine	Psychiatry	GP/GS	Internal medicine	Pediatrics	Orthopedics	Others
Age	42.8 (11)	32.86 (8.8)	49.39 (7.8)	44.32 (11)	47.64 (9.2)	42.18 (11.6)	51.04 (6.2)	47.77 (7.5)
Knowledge	65.2 (15.7)	65.97 (16.6)	63.13 (13.6)	66.15 (13.2)	64.71 (13.6)	68.61 (16.7)	65 (16.8)	62.91 (16.6)
Overall_Improv_attit	6.25 (2)	6.99 (2.2)	5.61 (1.9)	6.36 (1.9)	5.5 (1.8)	6.12 (1.5)	6.18 (2.1)	5.8 (1.9)
Time_Spent_attitude	7.28 (2)	6.57 (2.5)	7.61 (1.1)	7.28 (1.8)	7.71 (1.9)	7.45 (1.4)	7.68 (1.4)	7.71 (1.8)
Overall_Jb_sat_attit	6.47 (2.5)	6.68 (2.6)	6.57 (2.7)	6.17 (2.4)	5.89 (2.8)	6.88 (2.5)	7.14 (2.1)	6.14 (2.5)
attitude_Focus_ACO	6.62 (2.3)	7 (2)	6.3 (2.7)	6.49 (2.2)	6.29 (2.2)	7.15 (2.1)	6.21 (2.4)	6.37 (2.6)
Correl_Qlty_attitude	5.82 (2.4)	6.65 (2.5)	5.09 (2)	6.06 (2.1)	4.79 (2.4)	5.82 (2.6)	5.43 (2.1)	5.37 (2.4)
Data_report	6.06 (2.2)	6.66 (2)	6.78 (1.6)	5.72 (2.1)	5.46 (2.2)	5.09 (1.7)	5.89 (2.5)	6.01 (2.5)
Actionable	5.97 (2.2)	6.11 (2.1)	6.17 (2)	5.55 (2.2)	5.86 (2.8)	5.85 (2)	5.96 (1.8)	6.09 (2.4)
Beneficial	6.03 (2.3)	6.52 (2)	5.78 (2.1)	5.72 (2.5)	5.39 (2.5)	5.88 (2.3)	5.96 (2.3)	6.01 (2.5)
Hi_Qlt_Lo	6.17 (2.4)	6.68 (2.1)	5.65 (3.1)	5.89 (2.5)	6.18 (2.4)	5.55 (2.2)	6 (2.4)	6.2 (2.4)
No_Hospital	6.19 (2.4)	6.93 (2.2)	5.52 (2.4)	5.7 (2.6)	5.86 (2.8)	5.91 (1.9)	5.64 (2.7)	6.24 (2.3)
Shared_save	6.17 (2.3)	6.54 (2.3)	6 (2.2)	5.79 (2.4)	5.68 (2.5)	5.82 (2.2)	6.82 (2.2)	6.1 (2.3)
Transitional	5.88 (2.3)	6.59 (2.3)	6.3 (1.9)	5.81 (2.3)	5.68 (2.5)	5 (1.9)	5.11 (2.4)	5.69 (2.4)

specialist, and only 20.4% with 10 residents having excellent knowledge. Those who have > 10 years in clinical field experience showed the highest percentage with 49% (24 respondents); 17 respondents (16.3%) were having < 5 years in clinical field experience. On the other hand, those who having administrative field experience showed almost a total of 87.8% compared with 16.3% (8 respondents) with no administrative experience and having excellent knowledge.

More than third of the respondents (34.7%) with 17 respondents were from Riyadh area, 24.5% with 12 respondents from Abha and Jazan area (south), then (20.4%) with 10 respondents from Jeddah; the other respondents were less than 10% from the other areas. Most of those working under the umbrella of Ministry of Health (MOH) in Riyadh and Jeddah with (20.4%) and (12.2%) respectively. The surprising results showed that (10.2%) of the respondents were from private sectors, which is higher than MOH in Damman and other governmental sectors.

4.2. Attitude and Confidence

The other concern of this study is how to evaluate attitude and confidence, which has been evaluated according to the answers of the respondents presented 0 - 10 as completely disagree to completely agree, for each of the point of the questionnaire. The investigators proposed to have the mode of each point of the questionnaire as the most frequent answer of the respondents; then to have the average of these modes to give a score to evaluate the attitude out of 10; this is

similarly, for what has happened for the confidence. Moreover, attitude had been evaluated as positive attitude for those who scored 8 and above, 5 - 7 as fair and 4 and below as negative attitude. For the confidence, who scored 8 and above had been evaluated as high confidence, 5 - 7 as moderate and 4 and below as low confidence.

Attitude of respondents was evaluated according to the respondent's answers for five questions to show their attitude from 0-upto-10 for the following questions: 1) Time available to spend with patients (Mode = 8), 2) Improving the overall health of your patients (Mode = 6), 3) Overall job satisfaction (Mode = 8), 4) The quality measures correlate to the quality of care provided to patients (Mode = 5), and 5) The focus on containing costs in ACO-based payment models influences my medical decision making (Mode = 7). The overall average of the modes of the attitude was 6.8 out of 10, as shown in **Tables 2-5**.

Similar evaluation for the confidence, for the following questions 1) Use meaningful data reports about my population's health and healthcare utilization in a timely manner (Mode = 6), (2) Identify meaningful and actionable insights from the data I receive about my population's health and healthcare utilization (Mode = 6), 3) Negotiate care coordination agreements with other providers in my community that are beneficial to my practice and my patients (Mode = 5), 4) Provide high quality care to my patient population at low total cost, (Mode = 6), 5) Reduce unnecessary hospitalizations in my patient population (Mode = 7), 6) Succeed in sharing savings in a shared savings or risk-based contract (Mode = 5), 7) Manage the care of my patients as they transition between healthcare settings (Mode = 6). The overall average of the modes for the confidence was 5.9 out of 10, as shown in **Tables 2-5**.

5. Discussion

The transformation of healthcare system to be accountable care organization became a trend worldwide due to multi-advantages from ACO model. The opportunity to have value in integrated health care system with efficient care delivery, low cost, better patient satisfaction, and to have physicians with proper diagnosis and better treatment plan. The advantages of ACO can be concluded with joint responsibility of physicians and their care and autonomy to consider and select their physicians (Curnow Jr. & Doers, 2013).

This study was prospective cross-sectional conducted on 321 physicians to assess their knowledge, attitude and confidence toward implementation of ACO in Saudi Arabia. The overall average knowledge of the participating physicians was 65.2 (± 15.7 SD) out of 100, which was exactly found in previous study (Staloff et al., 2019). It has been noticed that only 49 respondents (15.3%) of the respondents were with excellent knowledge and being aware about ACO, 43% were consultants, 49% were having > 10 years' experience in clinical field and 87.8% were having administrative field experience. This study showed that 35% of the physicians were having poor knowledge with a cloudy picture on how, when,

what specialty to start with in order to implement ACO model in KSA. Makkah and Madinah region had the best average of knowledge compared with other regions scored 70.18 (14.7) which is considered good knowledge, next was Riyadh with score 67.15 (15.2). Although pediatrics showed the best knowledge among other specialties with score of 68.61 (16.7) however, the average of knowledge was almost the same with no significant difference.

Up-to-date, there is no clear definition about the difference between the current health care system and implementation of ACO model from a medical point of view. Many challenges stand against developing ACO such as resistance, how and when to start (Lewis et al., 2019). Although there is increasing of implementation of ACO models in the USA, however, ACO models considered as still in the early steps (Kaufman et al., 2019), and no comprehensive evidenced with the results that have been achieved so far.

Currently, ACO focused on primary health care services, how to improve it with better patient's care and with less cost (Brummel et al., 2014), but everyone should put in mind ACO model will be implemented on other medical fields such as surgery, imaging, and other medical fields in addition to other health care professionals (DeVore & Champion, 2011). ACOs provide independent clinical practice for physicians and improve coordination between ACOs, which should have the same opportunity for other healthcare specialties.

The respondents were 163 females (50.8%) and 158 males (49.2%); the consultants were 147 (45.8%), specialists 82 (25.5%) and residents with 99 (30.8%). Those who had ten years of clinical field experience were 147 respondents (45.8%). This was in contrast with other study conducted to evaluate the knowledge among Rhode Island (RI) physician, their attitudes, and confidence to achieve their goals in Accountable Care Organizations (ACOs); found that male ratio 69%, specialists were 50% of responders while primary health care doctors represented 49%, participants had more than ten years' experience represented 54% (Staloff et al., 2019).

Regarding the relation of knowledge about ACOs, the current study found that Almost 43% with 21 consultants had excellent knowledge about ACO, 36.7% with 18 specialists, and only 20.4% with ten residents having excellent knowledge. Those who have > 10 years in clinical field experience showed the highest percentage with 49% (24 respondents); 17 respondents (16.3%) had < 5 years in clinical field experience.

The current study suggested that there was no significant difference between the level of knowledge toward ACOs between males and females and between the position of the physician (consultant, specialist, or resident); this may be explained by the increased level of awareness among physicians in Saudi Arabia. It is also suggested that the level of knowledge was almost the same regarding different specialties (ranging from 62% - 68%); this may reflect the importance of integration between different specialties to ensure a successful ACO model. In contrast to another study conducted to compare ACO awareness and percep-

tions among specialists versus primary care physicians; results found that primary care physicians have more awareness and perception of ACO and its impact on patients' outcome, cost and quality of healthcare services, clinical practice and decisions than other specialists. This will give the impression of the importance of engaging specialists in ACO's clinical and professional decisions to improve the gap and limitation of knowledge of physicians in different specialties and hospitals (Markovitz et al., 2022).

Regarding the assessment of attitude, the overall average of mode was 6.8 out of ten which is considered as fair to positive attitude for most of the cases. The most positive attitude was regarding ACO effect on time available to spend with patients where the average of the mode score was 7.28 (± 2 SD). The result indicated that consultants were with the most positive attitude regarding time spent with patients with average of mode score of 7.96 (± 1.5 SD), on the other hand, the correlations of quality measures of ACO and quality of care provided to patients showed the least attitude with average of mode of fair attitude 5.8 (± 2.4 SD). Results showed that there was no significant difference in attitude between male and female neither there was significant difference between different specialties consultants, specialists and residents.

Interestingly, in the response of ACO effect on time spent with patients those who were working in the administrative field with experience of more than 10 years showed positive attitude compared to those who were less than 5 years of experience with administrative field. The results showed also that every category of the administrative field experience has superior results along with the counterpart of the clinical field experience. In conclusion, those with administrative experience had better attitude towards ACO than those with clinical experience.

The only distinguished value for attitude concerning regions was with Jeddah respondents in ACO effect on time available to spend with patients with average of mode score 8.09 (± 1.3 SD) out of 10 which considered as positive attitude. Other results were all with fair average, which have similar fair average for most of the results obtained from respondents from work place such as MOH hospitals, private hospitals or others (as shown in **Table 3**).

The specialty of family medicine showed the best average of mode among other specialties in attitude towards ACO effect in improving the overall health of their patients with score of 6.99 (± 2.2 SD) out of ten which considered as fair attitude although it is not significant difference with other specialty. Fair attitude was the most predominate score for all other specialties.

The results showed that the overall average of mode for the confidence was 5.9 out of 10, considered as moderate confidence for the respondents.

There is difference in results between male and female, which male showed more confidence in using of data reports about their population's health and utilization of healthcare in a timely matter with average mode score of 6.56 (± 2.1 SD) out of ten which considered moderate confidence. Except the average mode of confidence in providing high quality care to their patients population at low

total cost which female scored higher with average mode of 6.31 (± 2.4 SD) and male scored 6.03 (± 2.5 SD). Female scored the lowest in managing the care of their patents as they transition between healthcare settings with average mode confidence of 5.65 (± 2.4 SD). In conclusion, Male showed higher confidence compared with female.

There is similarity in results with no significant changes between consultants, specialists and residents with predominantly average mode of what considered as moderate confidence, the highest score is with residents' respondents in succeeding in reducing unnecessary hospitalization in patient population with average mode of confidence 6.69 (± 2.1 SD).

It is expected to find the results that those physicians who were working in the clinical field showed similar confidence with those who were working in administrative field this was applied on those who were with less than 5 years, more than 5 years and those who had experience of 10 years and above.

Regarding regional areas, the physicians who were working in Riyadh and Jeddah had better confidence compared to those who were working in others regions. Riyadh region had the highest average of mode for confidence in succeeding in reducing unnecessary hospitalization in patient population with average score of mode of 6.59 (± 2.3 SD). Other results regarding work place of respondents such as MOH hospitals, private hospitals or others showed no major difference in confidence which most results were within moderate confidence.

Accountable Care Organizations (ACOs) would keep caregivers jointly responsible for the quality and costs of care, allow customers the autonomy to choose their caregivers, and engage physicians and consumers in their shared decision-making (Curnow Jr. & Doers, 2013).

Family medicine physicians showed higher confidence regarding ACO compared to other specialties, with highest of average mode of confidence in succeeding in reducing unnecessary hospitalization in patient population with score of 6.93 (± 2.2 SD) which is considered moderate confidence. Other specialties were all with similar results considered as fair to moderate confidence. This is strongly associated with what had been achieved by others (Colla et al., 2014). Primary care physicians provide a starting points to establish ACO (Kringos et al., 2019), and with the knowledge about ACO, family medicine should take the lead to ensure that ACO has strong primary care foundation to provide a successful ACO settings (Bobbitt, 2011).

Increased clinicians awareness about ACO system, and how to establish ACO will be associated with decreased resistance and perceived better quality (Markovitz et al., 2020). More studies about ACO and pegging physician's response and their participating to find out their impact and preparedness to establish ACO system (Schur & Sutton, 2017). Identifying the potential resources that physicians could expect for considering joining an ACO system could reflect practical efforts to deliver high-quality care (Berenson et al., 2016). Therefore, awareness will increase knowledge, which should have a positive impact

towards the attitude and confidence where this will give a hint to reduce resistance which is the main factor or main challenge for ACO establishment.

6. Conclusion

This study was conducted on 321 physicians to assess their knowledge, attitude and confidence toward implementation of ACO in Saudi Arabia. The overall average knowledge was 65.2 (± 15.7 SD) out of 100. Pediatrics showed the best knowledge among other specialties with a score of 68.61% (± 16.7 SD). However, this average of knowledge was with no significant difference compared with other specialties. The current study suggested that there was no significant difference between the level of knowledge of ACOs between males and females and between the specialties (consultant, specialist, or resident).

Results showed that there was no significant difference in attitude between males and females neither there was a significant difference between different specialties consultants, specialists and residents. Moreover, those physicians with administrative experience had better attitudes towards ACO than those with clinical experience. Other results were all with fair averages, which have a similar fair average for most of the results obtained from respondents from work place such as MOH hospitals, private hospitals or others. The fair attitude was the most predominate score for all other specialties.

Males showed higher confidence compared with females. There were similarities in results with no significant changes between consultants, specialists and residents with predominantly average mode of what is considered as moderate confidence, the highest score is with residents' respondents in succeeding in reducing unnecessary hospitalization in patient population with an average mode of confidence 6.69 (± 2.1 SD). Lastly, physicians who were working in the clinical field showed similar confidence to those who were working in the administrative field.

The main conclusion of this study is that Saudi Arabia is ready for the transformation and vision 2030 to adopt the ACO health care system with this knowledge, attitude and confidence of the Saudi physicians.

Acknowledgements

Authors would like to thank all the respondents for their contribution in this study and their comments and also should acknowledge the support of the research center at the King Saud Medical Center.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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