

# Evaluation of Team-Based Care Implementation in Primary Health Care Services in Saudi Arabia

Arwa Nasser Al-Zahrani<sup>a</sup> Amjad Sulaiman Aldahmashi<sup>b</sup>  
Nashwa Mohamed Radwan<sup>c,d</sup> Nagla El Tigani El Fadil Mahmoud<sup>e</sup>  
Amal Hussain AlFaifi<sup>f</sup> Khalid Ibrahim Al-Abdulkareem<sup>g</sup>

<sup>a</sup>Public Health Specialist in Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia; <sup>b</sup>Health Management Senior Specialist in Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia; <sup>c</sup>Public Health Consultant in Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia; <sup>d</sup>Professor of Public Health and Community Medicine, Faculty of Medicine, Tanta University, Tanta, Egypt; <sup>e</sup>Department of Training, Development and Research, Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia; <sup>f</sup>Family Medicine Consultant in Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia; <sup>g</sup>The Head of Assisting Deputyship for Primary Health Care, Ministry of Health, Riyadh, Saudi Arabia

## Keywords

Primary health care · Team-based care · Normalization process theory · Facilitators · Barriers

## Abstract

**Introduction:** Saudi Ministry of Health (MOH) is starting to transfer the delivery of primary health care (PHC) services from solo practice to team-based care (TBC) model. It is an important to understand factors that affect the integration of this new model of care in the early stage of implementation process to ensure adequate incorporation of this new intervention into the routine work in PHC centers. Normalization process theory (NPT) is a method that helps evaluate the integration of new interventions. Therefore, this study aimed to explain the integration of TBC model in PHC services and investigate the barriers that may hinder the implementation of this model through using NPT. **Methods:** A cross-sectional study was conducted in PHC centers of

Saudi MOH 7 months after the implementation of TBC model. A systematic random sample technique was used to select participants from all Saudi regions. A NPT questionnaire was sent online to the participants to collect data. **Results:** The study revealed that cognitive participation construct represented the highest score ( $4.06 \pm 0.74$ ) followed by coherence ( $3.78 \pm 0.87$ ) and reflexive monitoring ( $3.75 \pm 0.79$ ) constructs. Collective action construct represented the lowest integration score ( $3.48 \pm 0.68$ ). Gender, years of work experience, and duration of applying TBC model were not significant factors affecting the mean integration scores of the four constructs of NPT. **Conclusion:** The study recorded good integration scores of the included health staff to TBC model. However, the study demonstrated some barriers that may hinder the implementation progress of the model including inadequate staff training, insufficient resources, and lack of feedback reports. Other recorded barriers are the staff perception that TBC model affects the nature of their work and disrupts the working relationship.

Sufficient resources, adequate staff training with close supervision, and providing them with feedback reports regularly are recommended to support and improve the implementation of the TBC model in PHC services.

© 2023 The Author(s).  
Published by S. Karger AG, Basel

## Introduction

Primary health care (PHC) is a core element of universal health coverage and is defined as an approach to well health and focused on the needs of the individuals, families, and communities [1]. In Saudi Arabia, the health system faced challenges related to difficult access, limited quality, and inefficient health services. Under Saudi Vision 2030, the Kingdom is going through fundamental structural changes in all the sectors including health care. The health care sector is undergoing evolution on the back of rapid advancements in technology, research, and development in line with the global and regional trends. Therefore, Saudi Ministry of Health (MOH) is starting to transfer the delivery of PHC services from solo practice to team-based care (TBC) model [2].

TBC model is defined as a provision of services to persons, families, and/or communities by at least one health professional who collaborates with clients and their caregivers to achieve coordinated, high-quality care [3]. The advantages of TBC model include effective team communication, controlling workload, and improving access to care with quality improvement. In addition, it can manage the needs of high-risk patients, staff engagement in meaningful work, and improve satisfaction of both patients and staff [4].

The previous studies showed the effectiveness of TBC on clinical outcomes of patients with chronic diseases and there is a reduction of emergency department visits and hospitalizations [5]. In Singapore, the empaneled patient's health and process outcomes have been improved compared to others [6]. TBC model maximizes the knowledge and capability of nursing staff, allows the physician to focus his or her time on patient care activities, and provides the patient with an enhanced opportunity to interact with clinical staff [7].

In this context, efforts were added by the Saudi MOH to ensure this transformation including creating a guide with details to all PHC staff about how to create teams and impanel patients in the TBC model. In addition, a pilot project was conducted in Qassim region from September to December 2020 to test the feasibility of the

new model. Nevertheless, the actual implementation of the TBC model in all Saudi regions/clusters was started in 2021. Team formation and impanel patients were conducted depending on the workforce in each PHC center. Impanel patients include the population who get most of their primary care from a given clinician and usually about 3,000 persons in each team. Each team is composed of at least a family physician and a nurse. It may also include a health coach and case coordinator. The physician is responsible for the physical examination and provides proactive care, decision-making, and development of care plan. Nurse is responsible for screening services and control of chronic disease. Health coach provides individualized health coaching to individuals. A case coordinator arranges referrals, including scheduling appointments, and entering consult reports into the record system [2].

It is important to understand factors that affect the integration of this new model of care in the early stage of implementation process to ensure adequate incorporation of this new intervention into the routine work in PHC services. Normalization process theory (NPT) is a method to evaluate the implementation, embedding and integration of new health techniques, technologies, and other complex interventions [8]. NPT explains routine embedding by reference to four constructs, namely, coherence, cognitive participation, collective action, and reflexive monitoring. Coherence defines the components of a practice. Cognitive participation organizes the people implicated in a complex intervention. Collective action explains the enhancing of a practice. Reflexive monitoring accesses the outcomes of a practice [9]. A study applied NPT method and used a descriptive qualitative approach embedded in mixed-methods indicated that regular communication among all team members, the development of procedures and/or protocols to support team processes, and ongoing review and feedback are critical to implementation of innovations involving primary care teams [8].

In addition, O'Reilly et al. [10] 2017 conducted a meta-analysis article included 10 countries and utilized NPT to assess the facilitators and barriers of interdisciplinary team working in primary care. They found that health care providers emphasized the importance of having clear policies about interdisciplinary team working, clarity about each other's expectations, and a clear focus on patient care. Participants across most of the 10 included countries reported that, in practice, they have experienced of poor communication and interpersonal conflicts as barriers to change. Supportive legislation and governance models and committed leadership were viewed as being facilitators.

Accordingly, knowing how people are actually working and what they are doing and understanding the factors that promote/inhibit routine incorporation of a new project can help explain the success of the program initiatives and inform implementation [11]. Therefore, this study aimed to explain the integration of TBC model in PHC services and to investigate the barriers that may hinder the implementation of this new model by using the four constructs of NPT, namely, coherence, cognitive participation, collective action, and reflexive monitoring.

### Objectives

1. To evaluate the integration of TBC model in PHC services using the four constructs of NPT, namely, coherence, cognitive participation, collective action, and reflexive monitoring.
2. To determine the facilitators and the barriers that may enhance/hinder the implementation of this new model.

## Materials and Methods

### Study Design

A cross-sectional study was conducted from June to December 2021 among health care providers in Saudi Arabia. The study was accomplished in PHC centers of Saudi MOH 7 months after the implementation of TBC model.

### Population and Sampling

A multistage sampling technique was utilized to select the eligible subjects. The first stage was a simple random sample to select one PHC center from each of the main five regions in Saudi Arabia. The second stage was a systematic random sample to select the eligible subjects from each selected PHC center. The inclusion criteria are health care providers (physicians, nurses, and case coordinators) working in PHC centers, at any age, both sexes.

The sample size was calculated using the Cochran formula ( $n = Z^2 PQ/d^2$ ). Where  $n$  = required minimum sample size,  $Z$  = standard normal variable, which is 1.96,  $P$  is the proportion of total facilities offering a given service/proportion of facility staff performing a given service in PHC center, which is taken as 40%,  $Q = 1-P$ ,  $d$  = acceptable margin of error, which is considered as 0.05 at 95% confidence interval. Accordingly, an estimated minimum sample size of 368 participants was included in this study.

### Data Collection

NPT questionnaire (Finch et al. 2018) was utilized to collect data. The questionnaire was translated into Arabic by the authors. Experts in the MOH reviewed the Arabic version for validity and reliability of all items. The validity was measured through face validity, and test-retest reliability was conducted for the reliability. In addition, Cronbach's alpha test was conducted to measure the consistency of the items [12]. The questionnaire was sent online to the study participants after obtaining their email addresses from the MOH database. The questionnaire consists of two parts. The

first part includes data regarding background and work variables (e.g., region, sex, nationality, job title, years of experience). The second part of the questionnaire includes items related to the measurement of the four constructs of the NPT, e.g., coherence, cognitive participation, collective action, and reflexive monitoring.

### Statistical Analysis

Data were analyzed using SPSS software package, version 21, and the level of significance was considered at  $p < 0.05$ . The frequency of the agreement of the studied health staff to the four constructs of NPT (coherence, cognitive participation, collective action, and reflexive monitoring) was measured on a five-point Likert scale ranging from agree to disagree. An agreement score  $\geq 3.0$  was considered as acceptable integration and as a facilitator for the implementation of the TBC model in PHC services. While a score  $< 3.0$  is considered as low integration and as a barrier for the implementation. Comparisons of the integration scores of all items of the four constructs of NPT relative to health care providers (physicians and nurses/case coordinators), gender, years of experience, and period of application of the TBC model were conducted using Mann-Whitney test.

## Results

Table 1 portrays the geographical distribution of the studied subjects relative to geographical regions in Saudi Arabia. The highest percentage of doctors was from the West region, while the highest percentages of nurses and case coordinators were from the Central region (75%, 29%, and 19%, respectively). Three hundred sixty-six health staff completed the questionnaire with about 45% response rate. Most of them were males (54%) aged from 31 to 40 years. Although 94% of nurses and 88% of case coordinators are Saudis, around three quarters of doctors (74%) are non-Saudis. In addition, about half of the nurses (47%) and one-third of coordinators (31%) had 10–15 years of experience compared to 35% of doctors.

The responses of all studied health staff to the four constructs of the NPT are provided in Likert scale in Table 2. The scale had high internal consistency for all items (Cronbach's alpha  $> 0.7$ ). The mean total score for all the studied constructs was  $3.75 \pm 0.04$ . All the four studied constructs of NPT recorded high score ( $\geq 3$ ) among all studied health staff indicating good staff integration. Cognitive participation construct represented the highest score ( $4.06 \pm 0.74$ ) followed by coherence ( $3.78 \pm 0.87$ ) and reflexive monitoring constructs ( $3.75 \pm 0.79$ ). Collective action construct represented the lowest integration score ( $3.48 \pm 0.68$ ). Regarding the items of these four constructs, almost all the items of collective action recorded lower scores ( $< 3.75$ ). More than sixty percentage of studied subjects agreed/strongly agreed for

**Table 1.** Geographical distribution and background variables of the studied subjects

Background variables	Doctors N (%)	Nurses N (%)	Case coordinator N (%)
<b>Health regions</b>			
Central (n = 100)	52 (52)	29 (29)	19 (19)
East (n = 42)	29 (69)	9 (21)	4 (9)
North (n = 56)	36 (64)	15 (27)	5 (9)
West (n = 83)	62 (75)	11 (13)	10 (12)
South (n = 85)	54 (63)	18 (21)	13 (15)
<b>Sex</b>			
Male (n = 198)	135 (57)	27 (33)	36 (71)
Female (n = 168)	98 (43)	55 (67)	15 (29)
<b>Age-groups</b>			
20–30 (n = 42)	25 (11)	9 (11)	8 (16)
31–40 (n = 193)	107 (46)	57 (70)	29 (57)
41–50 (n = 94)	67 (29)	14 (17)	13 (25)
51–60 (n = 33)	30 (13)	2 (2)	1 (2)
>60 (n = 4)	4 (1)	0	0
<b>Nationality</b>			
Saudi (n = 183)	61 (26)	77 (94)	45 (88)
Non-Saudi (n = 183)	172 (74)	5 (6)	6 (12)
<b>Years of experience</b>			
<1 year (n = 11)	10 (4)	0	1 (2)
1–5 years (n = 47)	34 (15)	5 (6)	8 (16)
5–10 years (n = 111)	81 (35)	15 (18)	15 (29)
10–15 years (n = 106)	52 (22)	38 (47)	16 (31)
>15 years (n = 91)	56 (24)	24 (29)	11 (22)
<b>Total (n = 366)</b>	<b>233 (64)</b>	<b>82 (22)</b>	<b>51 (14)</b>

all items of studied constructs reflecting good staff integration. Additionally, more than eighty percentage of them agreed/strongly agreed that participating in TBC model is a legitimate part of their role (85.0%). They added that they open to work with colleagues in new ways (87.4%) and continue to support the new TBC model (87.4%). However, only 39.6% and 40.2% of the staff agreed/strongly agreed about the availability of sufficient resources and adequate training of the staff.

Almost, gender and the years of work experience were not significant factors affecting the mean integration scores of the four constructs of NPT ( $p > 0.05$ ) (Tables 3, 4). Years of experience only significantly affect the integration score about the agreement of the staff that there are key people who drive TBC model forward and get others involved ( $3.72 \pm 0.97$  vs.  $3.38 \pm 1.21$ ) and the agreement score of the staff awareness about positive consequences of TBC model ( $3.49 \pm 1.02$  vs.  $3.16 \pm 1.02$ ) ( $p = 0.035$  and  $0.024$ , respectively) (Table 4).

Similarly, duration of the formation of the TBC model in PHC centers was not a significant variable affecting the integration scores of all the items of the four studied constructs among studied subjects ( $p > 0.05$ ) (Table 5). Furthermore, no significant difference was recorded regarding the mean integration scores for all the studied

constructs between physicians and nurses/case coordinators ( $p > 0.05$ ) (Table 6).

## Discussion

TBC is the new model of PHC services provided in Saudi Arabia. It is a challenge to apply a new huge intervention like TBC project into PHC services. The current study applied NPT to explain the integration and implementation of this new model and to identify factors that promote/inhibit routine incorporation of it into everyday health care. NPT could provide a straightforward conceptual framework to help health care providers and policy makers to judge the potential implementation of the new intervention, either allowing for improvement or deciding that the intervention simply lacks implement ability and that further work is not warranted [13].

The current study revealed that all the four studied constructs of NPT recorded high scores among all studied health care providers and more than sixty percentage of them agreed/strongly agreed for all items of studied constructs indicating good staff integration. Cognitive participation construct represented the highest integration score among studied subjects and thus, all the items

**Table 2.** Likert scale of the responses of all health staff toward the four constructs of the normalization process theory

Integration items	Disagree/strongly disagree	Neutral	Agree/strongly agree	Mean	SD
	frequency (%)	frequency (%)	frequency (%)		
<b>Coherence</b>					
I can see how TBC positively differs from usual ways of working	42 (11.5)	90 (24.6)	234 (63.9)	3.71	0.99
Staff in this organization have a shared understanding of the purpose of TBC	43 (11.7)	73 (19.9)	250 (68.3)	3.75	0.99
I understand how TBC affects the nature of my own work	44 (12.0)	93 (25.4)	229 (62.6)	3.71	1
I can see the potential value of TBC for my work	26 (7.1)	66 (18.0)	274 (74.9)	3.95	0.91
<b>Mean total score of coherence</b>				<b>3.78</b>	<b>0.87</b>
<b>Cognitive Participation</b>					
There are key people who drive TBC forward and get others involved	48 (13.1)	89 (24.3)	229 (62.6)	3.67	1.02
I believe that participating in TBC is a legitimate part of my role	17 (4.6)	38 (10.4)	311 (85.0)	4.15	0.84
I'm open to working with colleagues in new ways to use TBC	14 (3.8)	32 (8.7)	320 (87.4)	4.21	0.04
I will continue to support TBC	12 (3.3)	34 (9.3)	320 (87.4)	4.23	0.8
<b>Mean total score of cognitive participation</b>				<b>4.06</b>	<b>0.74</b>
<b>Collective Action</b>					
I can easily integrate TBC into my existing work	39 (10.7)	68 (18.6)	259 (70.8)	3.83	1.02
TBC disrupts working relationships*	98 (26.8)	84 (23.0)	184 (50.3)	3.22	1.18
I have confidence in other people's ability to use TBC	38 (10.4)	96 (26.2)	232 (63.4)	3.7	0.94
Work is assigned to those with skills appropriate to TBC	44 (12.0)	95 (26.0)	227 (62.0)	3.63	0.97
Sufficient training is provided to enable staff to implement TBC	109 (29.8)	110 (30.1)	147 (40.2)	3.14	1.1
Sufficient resources are available to support TBC	103 (28.1)	118 (32.2)	145 (39.6)	3.16	1.09
Management adequately supports TBC	44 (12.0)	85 (23.2)	237 (64.8)	3.71	1
<b>Mean total score of collective action</b>				<b>3.48</b>	<b>0.68</b>
<b>Reflexive Monitoring</b>					
I am aware of reports about the effects of TBC	70 (19.1)	100 (27.3)	196 (53.6)	3.43	1.03
The staff agree that TBC is worthwhile	38 (10.4)	80 (21.9)	248 (67.8)	3.73	0.93
I value the effects of TBC on my work	35 (9.6)	96 (26.2)	235 (64.2)	3.69	0.93
Feedback about TBC can be used to improve it in the future	21 (5.7)	48 (13.1)	297 (81.1)	4.02	0.85
I can modify how I work with TBC	26 (7.1)	62 (16.9)	278 (76.0)	3.88	0.88
<b>Mean total score of reflexive monitoring</b>				<b>3.75</b>	<b>0.79</b>
<b>The total mean score of 4 construct</b>				<b>3.75</b>	<b>0.04</b>

of the construct could be considered as facilitators for the integration of TBC model in PHC centers. In addition, more than eighty percentage of studied subjects agreed/strongly agreed that participating in TBC model is a legitimate part of their role and they are open to work with colleagues in the new ways of the model and

continue to support it. This was consistent with O'Reilly et al. [14] who stated that the champions, key people who drive TBC forward and get others involved, are the key facilitator for program implementation.

For the coherence construct, most studied health care providers agreed/strongly agreed about the potential value of

**Table 3.** The mean integration scores of the four constructs of normalization process theory relative to gender

Items of the constructs of NPT	Male (n = 198)		Female (n = 168)		p value
	mean	SD	mean	SD	
I can see how TBC positively differs from usual ways of working	3.69	1.05	3.73	0.92	0.961
Staff in this organization have a shared understanding of the purpose of TBC	3.78	1.02	3.72	0.96	0.401
I understand how TBC affects the nature of my own work	3.68	1.04	3.74	0.95	0.728
I can see the potential value of TBC for my work	3.93	0.96	3.97	0.86	0.935
<b>Mean coherence</b>	<b>3.77</b>	<b>0.93</b>	<b>3.79</b>	<b>0.81</b>	<b>0.777</b>
There are key people who drive TBC forward and get others involved	3.65	1.04	3.70	0.99	0.604
I believe that participating in TBC is a legitimate part of my role	4.07	0.93	4.24	0.72	0.172
I'm open to working with colleagues in new ways to use TBC	4.13	0.90	4.32	0.68	0.105
I will continue to support TBC	4.16	0.87	4.31	0.70	0.174
<b>Mean cognitive participation</b>	<b>4.00</b>	<b>0.81</b>	<b>4.14</b>	<b>0.64</b>	<b>0.166</b>
I can easily integrate TBC into my existing work	3.80	1.10	3.87	0.91	0.956
TBC disrupts working relationships	3.12	1.23	3.34	1.12	0.117
I have confidence in other people's ability to use TBC	3.66	1.04	3.74	0.80	0.804
Work is assigned to those with skills appropriate to TBC	3.60	1.02	3.67	0.90	0.710
Sufficient training is provided to enable staff to implement TBC	3.12	1.16	3.16	1.02	0.621
Sufficient resources are available to support TBC	3.12	1.18	3.21	0.96	0.427
Management adequately supports TBC	3.68	1.06	3.74	0.92	0.779
<b>Mean collective action</b>	<b>3.44</b>	<b>0.77</b>	<b>3.53</b>	<b>0.56</b>	<b>0.352</b>
I am aware of reports about the effects of TBC	3.49	1.04	3.38	1.02	0.271
The staff agree that TBC is worthwhile	3.69	1.00	3.77	0.84	0.673
I value the effects that TBC has had on my work	3.64	1.01	3.75	0.83	0.467
Feedback about TBC can be used to improve it in the future	3.98	0.91	4.08	0.78	0.430
I can modify how I work with TBC	3.81	0.96	3.97	0.75	0.205
<b>Mean reflexive monitoring</b>	<b>3.72</b>	<b>0.86</b>	<b>3.79</b>	<b>0.69</b>	<b>0.800</b>
<b>Mean total</b>	<b>3.71</b>	<b>0.86</b>	<b>3.79</b>	<b>0.69</b>	<b>0.461</b>

TBC model. This finding is a strong facilitator, as the agreement on the purpose of a new model is needed for consistent implementation as the model progresses [15, 16]. Similarly, O'Reilly et al. [14] found that the idea of team formation of the TBC model makes sense to most of the studied subjects. However, two coherence items in our study recorded low scores and are considered as barriers for the implementation of the TBC model in PHC services. These items are concerned with the perception of the staff about how TBC model differs from the usual ways of work and how it affects the nature of their work. Nevertheless, successful implementation of new clinical practices is not dependent only on the change in individual behaviors but also on the organizational and environmental context [17, 18].

Concerning reflexive monitoring construct, we noticed that most of the staff agreed/strongly agreed that feedback information about TBC model could be useful to improve it in the future. Nevertheless, about half of them only agreed that they are aware about the feedback reports of the outcome of the TBC mode. This issue could be considered as a barrier for implementation and suggest the importance of frequent monitoring of TBC intervention

and providing the staff with feedback reports to maintain the progress implementation of the model [19–21]. This was in harmony with other studies using the NPT framework for evaluation of the implementation of new interventions [11, 22, 23]. In the same line, Peng et al. [8] recorded a gap in accessibility of receiving feedback about the program outcomes among studied staff, which affects the program delivery. Additionally, it was documented that involving the participants in early stages of the project to clarify their roles and timely informing them about the effects of a new project is critical for successful implementation of this program [15, 16].

The current study also yielded interesting results regarding collective action, which represented the lowest integration scores and thus was considered as a barrier for the integration of TBC model in PHC services. Surprising, about half of the studied health staff agreed/strongly agreed that TBC project disrupts the working relationship. This finding could be a strong barrier for the project implementation, as good staff communication and shared understanding is critical for successful implementation of a new intervention [24, 25]. Moreover,

**Table 4.** The mean integration scores of the four constructs of normalization process theory relative years of experience

Items of the constructs of NPT	0–5 years (n = 58)		More than 5 years (n = 308)		p value
	mean	SD	mean	SD	
I can see how TBC positively differs from usual ways of working	3.62	1.09	3.72	0.97	0.690
Staff in this organization have a shared understanding of the purpose of TBC	3.67	1.08	3.77	0.97	0.664
I understand how TBC affects the nature of my own work	3.55	1.05	3.74	0.99	0.259
I can see the potential value of TBC for my work	3.88	0.99	3.96	0.90	0.636
<b>Mean coherence</b>	<b>3.68</b>	<b>0.93</b>	<b>3.80</b>	<b>0.86</b>	<b>0.443</b>
There are key people who drive TBC forward and get others involved	3.38	1.21	3.72	0.97	0.035
I believe that participating in TBC is a legitimate part of my role	4.09	0.86	4.16	0.84	0.503
I'm open to working with colleagues in new ways to use TBC	4.05	0.93	4.24	0.78	0.138
I will continue to support TBC	4.05	0.89	4.26	0.78	0.070
<b>Mean cognitive participation</b>	<b>3.89</b>	<b>0.82</b>	<b>4.10</b>	<b>0.72</b>	<b>0.070</b>
I can easily integrate TBC into my existing work	3.64	1.18	3.87	0.98	0.222
TBC disrupts working relationships	3.22	1.19	3.22	1.18	0.983
I have confidence in other people's ability to use TBC	3.53	0.92	3.73	0.94	0.119
Work is assigned to those with skills appropriate to TBC	3.50	1.06	3.66	0.95	0.321
Sufficient training is provided to enable staff to implement TBC	2.93	1.15	3.18	1.08	0.151
Sufficient resources are available to support TBC	2.95	1.13	3.20	1.08	0.149
Management adequately supports TBC	3.64	1.05	3.72	0.99	0.644
<b>Mean collective action</b>	<b>3.35</b>	<b>0.78</b>	<b>3.51</b>	<b>0.66</b>	<b>0.260</b>
I am aware of reports about the effects of TBC	3.16	1.04	3.49	1.02	0.024
The staff agree that TBC is worthwhile	3.57	1.06	3.76	0.90	0.272
I value the effects that TBC has had on my work	3.57	1.08	3.71	0.90	0.405
Feedback about TBC can be used to improve it in the future	4.00	1.01	4.03	0.82	0.763
I can modify how I work with TBC	3.78	0.88	3.90	0.88	0.256
<b>Mean reflexive monitoring</b>	<b>3.61</b>	<b>0.86</b>	<b>3.78</b>	<b>0.77</b>	<b>0.252</b>
<b>Mean total</b>	<b>3.61</b>	<b>0.86</b>	<b>3.78</b>	<b>0.77</b>	<b>0.247</b>

\*Test used (Mann-Whitney Test).

about one-third of studied subjects agreed/strongly agreed about lack of sufficient resources and adequate training of the staff. Similarly, Bradley and Patterson [26] and Peng et al. [8] demonstrated the need for sufficient resources, staff training, and regular supervision of health staff to integrate TBC in PHC services. Likewise, Lau et al. [27] suggested the importance of careful assessment of junior staff by different professional levels as they may lack the experience and might misunderstand the information they receive. In addition, an adequate training allows the participants to understand their role, and regular supervision ensures the delivery of high-quality care [28].

Interestingly, no significant difference was recorded between physicians and nurses/case coordinators regarding the mean integration scores for all the studied constructs ( $p > 0.05$ ). Furthermore, about one-third of nurses and about half of doctors and case coordinators agreed/strongly agreed that TBC model disrupts working relationship. Similarly, gender, the years of work experience, and

duration of the formation of the TBC project in PHC centers were not significant factors affecting the mean integration scores of the four constructs of NPT ( $p > 0.05$ ). In the same line, Mishuris et al. [29] found a little variation between clinic managers and medical directors across practice sites regarding the median domain scores.

#### Conclusion and Recommendations

This study revealed good integration of all studied health staff to TBC model in PHC centers. Additionally, the recorded facilitators for the implementation of this model included the health staff perception of the potential value of the model and that it is a legitimate part of their role to participate and work with colleagues in this new ways of the model. On the other hand, the recorded barriers that might hinder the implementation progress of the model included insufficient resources and inadequate staff training with lack of feedback reports. Other recorded barriers are the staff perception that TBC model

**Table 5.** The mean integration scores of the twenty items of the four constructs of normalization process theory regarding duration of TBC formation

Items of the constructs of NPT	0-5 months (n = 106)		>5 months (n = 260)		p value
	mean	SD	mean	SD	
I can see how TBC positively differs from usual ways of working	3.70	0.91	3.71	1.02	0.544
Staff in this organization have a shared understanding of the purpose of TBC	3.84	0.87	3.72	1.03	0.554
I understand how TBC affects the nature of my own work	3.73	0.98	3.70	1.01	0.96
I can see the potential value of TBC for my work	3.93	0.89	3.96	0.93	0.63
<b>Mean coherence</b>	<b>3.80</b>	<b>0.82</b>	<b>3.77</b>	<b>0.90</b>	<b>0.804</b>
There are key people who drive TBC forward and get others involved	3.76	0.94	3.63	1.04	0.337
I believe that participating in TBC is a legitimate part of my role	4.12	0.85	4.15	0.84	0.70
I'm open to working with colleagues in new ways to use TBC	4.21	0.74	4.22	0.84	0.60
I will continue to support TBC	4.18	0.78	4.25	0.81	0.31
<b>Mean cognitive participation</b>	<b>4.07</b>	<b>0.73</b>	<b>4.06</b>	<b>0.74</b>	<b>0.961</b>
I can easily integrate TBC into my existing work	3.87	0.96	3.82	1.04	0.891
TBC disrupts working relationships	3.08	1.2	3.27	1.17	0.156
I have confidence in other people's ability to use TBC	3.69	0.88	3.70	0.97	0.609
Work is assigned to those with skills appropriate to TBC	3.68	0.93	3.61	0.98	0.749
Sufficient training is provided to enable staff to implement TBC	3.09	1.13	3.16	1.08	0.617
Sufficient resources are available to support TBC	3.14	1.09	3.17	1.09	0.737
Management adequately supports TBC	3.76	0.88	3.69	1.05	0.872
<b>Mean collective action</b>	<b>3.47</b>	<b>0.64</b>	<b>3.49</b>	<b>0.70</b>	<b>0.555</b>
I am aware of reports about the effects of TBC	3.36	0.99	3.47	1.04	0.271
The staff agree that TBC is worthwhile	3.65	0.83	3.76	0.97	0.092
I value the effects that TBC has had on my work	3.67	0.84	3.70	0.97	0.466
Feedback about TBC can be used to improve it in the future	3.98	0.77	4.04	0.89	0.252
I can modify how I work with TBC	3.83	0.81	3.90	0.90	0.216
<b>Mean reflexive monitoring</b>	<b>3.70</b>	<b>0.73</b>	<b>3.77</b>	<b>0.81</b>	<b>0.172</b>
<b>Mean total</b>	<b>3.70</b>	<b>0.73</b>	<b>3.77</b>	<b>0.81</b>	<b>0.498</b>

**Table 6.** Comparison between physicians and nurses/care coordinators regarding the four constructs of the normalization process theory

Domain	Mean integration score <3.75		Mean integration score 3.75+		Total	p value
	frequency	%	frequency	%		
Mean coherence						
Physicians	80	34.3	153	65.7	233	0.735
Nurses and care coordinators	48	36.1	85	63.9	133	
Mean cognitive participation						
Physicians	42	18.0	191	82.0	233	0.087
Nurses and care coordinators	34	25.6	99	74.4	133	
Mean collective action						
Physicians	168	72.1	65	27.9	233	0.297
Nurses and care coordinators	89	66.9	44	33.1	133	
Mean reflexive monitoring						
Physicians	88	37.8	145.00	62.2	233	0.499
Nurses and care coordinators	55	41.4	78.00	58.6	133	
Mean total						
Physicians	105	45.1	128	54.9	233	0.788
Nurses and care coordinators	58	43.6	75	56.4	133	



affects the nature of their work and disrupts the working relationship. Sufficient resources, adequate staff training with close supervision, and providing them with feedback reports regularly are recommended to support and improve the implementation of the TBC model in PHC services.

### Limitations

To our knowledge, this is the first study uses NPT to examine the integration of TBC model in PHC services. The study also provided a comprehensive view of the barriers that may hinder the implementation of this model. However, the small number of recruited participants due to the low response rate of health staff was the main limitation of the study. Besides, the study reported other bias of the cross-section design including the self-reported answers to the online questionnaire.

### Statement of Ethics

Ethics approval of this study proposal received from Institutional Research Board (IRB) of Saudi Ministry of Health (MOH), approval number #21-84. Participation in this study is voluntary. Submitting the questionnaire will be considered as a consent to participate in this study. Informed consent to participate was not directly obtained but inferred by completion of the questionnaire. The data collected are anonymous, would be confidential, and will not be used for other purposes than the study.

### References

- 1 World Health Organization. *A vision for primary health care in the 21st century*. Switzerland; 2018.
- 2 Saudi MOH. *Saudi Ministry of Health is starting to transfer the delivery of Primary Health Care to team-based care*. Saudi MOH website; 2021. Available from: <https://www.moh.gov.sa/Ministry/MediaCenter/News/Pages/NEWS-2008-1-23-001.aspx>.
- 3 Pamela Mitchell IVK, Wynia M, Golden R, McNellis B, Okun S, Edwin Webb C, Valerierohrbach, "core principles and values of effective team-based health care. *Natl Acad Med*. 2012.
- 4 Sheridan B, Chien AT, Peters AS, Rosenthal MB, Brooks JV, Singer SJ. Team-based primary care: the medical assistant perspective. *Health Care Manage Rev*. Apr. 2018;43(2): 115–25.
- 5 Meyers DJ, Chien AT, Nguyen KH, Li Z, Singer SJ, Rosenthal MB. Association of team-based primary care with health care utilization and costs among chronically ill patients. *JAMA Intern Med*. 2019;179(1): 54–61.
- 6 Hu PL, Tan CY, Nyugen NHL, Wu RR, Bahadin J, Nadkarni NV, et al. Integrated care teams in primary care improve clinical outcomes and care processes in patients with non-communicable diseases. *Singapore Med J*. 2022;21.
- 7 Goldberg DG, Beeson T, Kuzel AJ, Love LE, Carver MC. Team-based care: a critical element of primary care practice transformation. *Popul Health Manag*. Jun 2013;16(3): 150–6.
- 8 Peng K, Liu H, Zhang J, Yang M, Liu Y, Tian M, et al. Applying normalization process theory and process mapping to understand implementation of a co-management program for older hip fracture patients in China: a qualitative study. *Arch Osteoporos*. 2020 Dec;15(1):92.
- 9 May C, Finch T. Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology*. 2009; 43(3):535–54.
- 10 O'Reilly P, Lee SH, O'Sullivan M, Cullen W, Kennedy C, MacFarlane A. Assessing the facilitators and barriers of interdisciplinary team working in primary care using normalisation process theory: an integrative review. *PLoS One*. 2017;12(5): e0177026.

### Conflict of Interest Statement

All authors declare that they have no conflicts of interest.

### Funding Sources

This work is supported by Saudi MOH.

### Author Contributions

Arwa Nasser Al-Zahrani is the overall guarantor for this study and conceived the idea. Arwa Nasser Al-Zahrani, Amjad Sulaiman Aldahmashi, Dr. Nashwa Mohamed Radwan, Dr. Nagla El Tigani El Fadil Mahmoud, Dr. Amal Hussain Alfaifi, and Dr. Khaled Ibrahim Al-Abdulkareem contributed to the study design, literature review, data collection, analysis, and interpreted the data. Arwa Nasser Al-Zahrani and Amjad Sulaiman Aldahmashi drafted the first draft of paper and were reviewed by Dr. Nashwa Mohamed Radwan. Manuscript final revision was done by Arwa Nasser Al-Zahrani, Amjad Sulaiman Aldahmashi, Dr. Nashwa Mohamed Radwan, Dr. Nagla El Tigani El Fadil Mahmoud, Dr. Amal Hussain Alfaifi, and Dr. Khaled Ibrahim Al-Abdulkareem and they approved the final version of this paper before submission.

### Data Availability Statement

Due to privacy, the data in the current study cannot be shared with others, but it is available if there is a reasonable request from Arwa Nasser Al-Zahrani. Further inquiries can be directed to the corresponding author.

- 11 Gould DJ, Hale R, Waters E, Allen D. Promoting health workers' ownership of infection prevention and control: using Normalization Process Theory as an interpretive framework. *J Hosp Infect.* 2016;94(4): 373–80.
- 12 Collins LM. Research design and methods. In: Birren JE, editor. *Encyclopedia of gerontology.* 2nd ed. 2007. p. 433–42.
- 13 Murray E, Treweek S, Pope C, MacFarlane A, Ballini L, Dowrick C, et al. Normalisation process theory: a framework for developing, evaluating and implementing complex interventions. *BMC Med.* 2010;8:63.
- 14 O'Reilly P, Lee SH, O'Sullivan M, Cullen W, Kennedy C, MacFarlane A. Assessing the facilitators and barriers of interdisciplinary team working in primary care using normalisation process theory: an integrative review. *PLoS One.* 2017;12(5):e0181893.
- 15 Parkin P. *Managing change in healthcare: using action research.* SAGE Knowledge; 2009.
- 16 Richard Grol DD, Wensing M, Eccles M. *Improving patient care: the implementation of change in health care.* 2nd ed; 2013.
- 17 Ploeg J, Davies B, Edwards N, Gifford W, Miller PE. Factors influencing best-practice guideline implementation: lessons learned from administrators, nursing staff, and project leaders. *Worldviews Evid Based Nurs.* 2007;4(4):210–9.
- 18 May C, Sibley A, Hunt K. The nursing work of hospital-based clinical practice guideline implementation: an explanatory systematic review using Normalisation Process Theory. *Int J Nurs Stud.* 2014;51(2):289–99.
- 19 Becher EC, Chassin MR. Improving quality, minimizing error: making it happen. *Health Aff.* 2001;20(3):68–81.
- 20 Schilling L. Implementing and sustaining improvement in health care. *Joint Comm J Qual Patient Saf.* 2008.
- 21 Scoville R, Little K, Rakover J, Luther K, Mate K. "Sustaining improvement. IHI White Paper." Inst. Healthc. Improv; 2016. p. 1–33.
- 22 Henderson EJ, Rubin GP. The utility of an online diagnostic decision support system (Isabel) in general practice: a process evaluation. *JRSM Short Rep.* 2013;4(5):31–11.
- 23 Jones CHD, Glogowska M, Locock L, Lasserion DS. Embedding new technologies in practice: a normalization process theory study of point of care testing. *BMC Health Serv Res.* 2016;16(1):591–10.
- 24 Proudlove N, Bisogno S, Onggo BS. "Towards fully-facilitated discrete event simulation modelling," no. August 2019. 2017.
- 25 Panella M, Marchisio S, Di Stanislao F. Reducing clinical variations with clinical pathways: do pathways work? *Int J Qual Health Care.* 2003;15(6):509–21.
- 26 Bradley PT, Patterson J. Attitudes to the implementation of speech and language therapist led low risk two week wait clinic in the UK: a survey exploration using normalization process theory. *J Voice.* 2021.
- 27 Lau TW, Leung F, Siu D, Wong G, Luk KDK. Geriatric hip fracture clinical pathway: the Hong Kong experience. *Osteoporos Int.* 2010; 21(Suppl 4):S627–36.
- 28 Dehghani K, Nasiriani K, Salimi T. Requirements for nurse supervisor training: a qualitative content analysis. *Iran J Nurs Midwifery Res.* 2016;21(1):63–70.
- 29 Mishuris RG, Palmisano J, McCullagh L, Hess R, Feldstein DA, Smith PD, et al. Using normalisation process theory to understand workflow implications of decision support implementation across diverse primary care settings. *BMJ Health Care Inform.* 2019; 26(1):e100088.