



Business models and provider satisfaction in in vitro fertilization centers in the USA

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Abstract

Purpose The number of in vitro fertilization (IVF) cycles is increasing and the majority of patients undergoing IVF pay out of pocket. Reproductive endocrinology and infertility practitioners employ different business models to help create financial pathways for patients needing IVF but details regarding the different types of business models being used and physician satisfaction with those models have not been described previously.

Methods A cross-sectional survey was sent to members of the Society of Reproductive Endocrinology and Infertility. The survey included 30 questions designed to assess demographics, practice patterns, and business models utilized.

Results A total of 222/736 (30%) physicians responded to the survey. The majority of physicians offer a-la-carte (67%), bundled services (69%), grants (57%), and cost/risk-sharing (50%). The majority answered that the single ideal business model is bundled services (53%). There was no significant association between financial package offered and region of practice or state-mandated insurance. The largest barrier to care reported was cost with or without state-mandated coverage (94% and 99%, respectively). The majority of practices are satisfied with their business model (75%). Higher physician satisfaction was associated with private practice [69% vs 27%; OR (95%CI) = 3.8 (1.7, 8.6)], male gender [59% vs 30%; OR = 2.4 (1.1, 5.4)], and offering bundled services [83% vs 59%; OR = 2.8 (1.2, 6.7)].

Conclusions Physicians utilize a variety of business models and most are satisfied with their current model. Cost is the major barrier to care in states with and without mandated coverage.

Keywords In vitro fertilization · Business models · Physician satisfaction · Barriers

Introduction

The cost of treatment has been identified as the greatest barrier to access to infertility care in the USA. The number of in vitro

fertilization (IVF) cycles is increasing and the majority of patients undergoing IVF pay out of pocket [1]. The average cost for a single IVF cycle including medications, oocyte retrieval, and the first embryo transfer is \$18,227 (range: \$6920–\$27,685) [2]. The high cost has led to disparities in health care and access.

As of 2015, 15 states have enacted legislative mandates with wide variation in policies that cover fertility services to varying degrees [3]. Tricare and the military health system also provide some services for their insured. However, for the majority of patients that are “self-pay” or receive partial coverage, there are different business models for cost appropriation.

Reproductive endocrinology and infertility (REI) practitioners work in a variety of settings and employ different business models to help create financial opportunities for patients needing IVF [4]. Details regarding the different types of business models being used have not been described previously. Little is known about

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actual utilization of shared costs, a-la-carte versus bundled services, use of insurance programs, grants or special discounts offered to different patient groups, and physician satisfaction with the differing models. Ethics of some of these business models has been addressed by the American Society for Reproductive Medicine (ASRM) [5].

Here, we analyzed the utilization of different business models and their relationship to demographics, practice patterns, physician satisfaction, and barriers to care.

Materials and methods

This study was reviewed by the Institutional Review Board at the University of Texas Health Science Center at San Antonio (UTHSCSA), determined to be exempt, and approved. A national online survey was sent via email to 736 board certified REIs with membership in the Society for Reproductive Endocrinology and Infertility (SREI). Study data were collected and managed using research electronic data capture (REDCap) tools hosted at UTHSCSA. REDCap is a secure, web-based application designed to support data capture for research studies [6]. The survey included 30 questions designed to assess demographics, practice patterns, and business models utilized. A-la-carte services was defined as fee-for-service where providers are paid for each service performed and services are unbundled and paid for separately. Bundled services was defined as offering several services as one combined package at a fixed price. Cost/risk-sharing included any type of financial risk-sharing program and included financial risk-sharing and refund programs. Grants were defined as non-repayable funds that were distributed or gifted from an organization outside of the practice. The survey was initially sent in May 2017 and closed to enrollment in August 2017. One reminder was emailed. Incentives included a \$50 gift card to the first 100 respondents and a random drawing for three computer tablets.

Descriptive statistics were expressed as means \pm standard deviation and median (IQR) for continuous variables. Counts with percentages were reported for categorical variables. Differences between those satisfied with current business model and those not satisfied, and those who offered each type of financial package versus those who did not, were assessed using Fisher's exact test for categorical data and Mann–Whitney test for continuous data. Potential predictors of physician satisfaction were assessed using logistic regression. A *p* value of <0.05 was considered statistically significant, testing was two-sided, and SAS Version 9.4 (SAS Institute, Cary, NC) was used.

Results

Demographics

A total of 222 respondents participated in the survey for a response rate of 30%. The majority of respondents were Caucasian (75%) with an average age of 49. Forty-one percent had 20+ years of practice and 59% were in private practice. Respondent's practice distribution was spread throughout the USA in the South (34%), Northeast (25%), Midwest (21%), and West (20%). The average number of fresh IVF cycles per practice reported to the Society for Assisted Reproductive Technology (SART) in 2015 was 463 and frozen embryo transfers (FET) were 274. Fifty-six percent of respondents were SART practice directors (Table 1).

Type of practice

The types of practices included the following: 12% of respondents in solo in practice, 79% in group practice, 7% in a multiple-site, single-state conglomerate, and 2% in a multiple site, multiple state conglomerate (Table 1). If they worked in a group or conglomerate, there were on average 4.7 providers at their primary location. The majority practiced with 1–4 registered nurses (RNs) (42%) and 1–4 medical assistants (MAs) (64%). The largest reported advantage of joining a multi-center conglomerate was business infrastructure (79%) and the largest disadvantage was lack of physician autonomy (87%) (Table 2).

Financial packages

There are many different types of packages offered to patients throughout the USA. Respondents offer a-la-carte services (67%), bundled services (70%), grants (57%), and cost/risk-sharing (50%). Most believe that the single ideal business model is bundled services (53%; Fig. 1).

Bundled services

For those that offer bundled services, the majority include ultrasound exams, laboratory fees, oocyte retrieval, embryo transfer, intracytoplasmic sperm injection, assisted hatching, and anesthesia. Most clinics do not bundle medications nor pre-implantation genetic testing (PGT) (Table 3). Inclusion of frozen embryo transfer in the bundled package was not ascertained. In programs that bundle cycles, 74% bundled single IVF cycles and 26% bundled multiple IVF cycles.

Table 1 Demographics among 222 survey participants

Demographics		
Gender	Male	51.9%
	Female	48.1%
Provider age (average)		49
Provider race	Caucasian	74.9%
	Hispanic	4.2%
	African American	6.0%
	Asian	11.6%
	Pacific Islander	0.5%
	Native American	0.5%
	Other	2.3%
Years in practice	0–5	21.5%
	5–10	19.3%
	10–20	17.7%
	20+	41.4%
Type of practice	Academic	41.1%
	Private practice	58.9%
	Solo practice	12.2%
	Group practice	79.0%
	Multiple site, single state conglomerate	6.6%
	Multiple site, multiple state conglomerate	2.2%
If group or conglomerate, number of providers at primary location (average)		4.7
Number of registered nurses at primary location	1–4	42.2%
	4–7	27.2%
	7–10	12.8%
	> 10	17.8%
Number of medical assistants at primary location	1–4	63.7%
	4–7	21.2%
	7–10	6.1%
Region of practice	> 10	8.9%
	Northeast	24.6%
	Midwest	21.2%
	West	20.1%
SART practice director	South	34.1%
	Yes	55.9%
Number of fresh IVF cycles/year by clinic reported to SART in 2015 (average)	No	44.1%
		463
Number of frozen FET cycles/year by clinic reported to SART in 2015 (average)		274
Practice in a state with state-mandated IVF coverage	Yes	19.2%
	No	80.8%

Grants

The most common grant offered was Livestrong (84%). Additional grants offered include Resolve (24%), Pay it Forward (14%), and Other (41%).

Table 2 The advantages (*n* = 160) and disadvantages (*n* = 162) of joining a multi-center conglomerate

Advantages (<i>n</i> = 160)	Disadvantages (<i>n</i> = 162)
Business infrastructure (78.8%)	Lack of physician autonomy (87.0%)
Financial benefits (53.1%)	Financial concerns (37.0%)
Camaraderie/mentorship (40.0%)	Location (16.7%)
Other (12.5%)	Other (13.6%)

Cost/risk-sharing

Cost/risk-sharing was offered by 19% in solo practice and 53% in group practices (*p* < 0.004). In programs offering a refund, 58% offered a refund to less than 5% of patients, whereas only 6% offered a refund to more than 25% of their patients.

Associations with financial packages

Respondents that offer bundled services performed more fresh IVF cycles and FETs per clinic (mean = 515 and 315, respectively, *p* = 0.001) compared to clinics that did not bundle (mean = 361 and 185, respectively, *p* = 0.002). Similarly, larger-volume fresh and frozen cycles were performed in practices that offered cost/risk-sharing (*p* = 0.007 and *p* < 0.001 for fresh IVF cycles and FET, respectively). Furthermore, offering grants was associated with large clinics as evidenced by a greater number of providers, greater number of RN, and higher number of fresh and frozen cycles performed per clinic (data not shown). There was no significant association between region of practice and financial package offered.

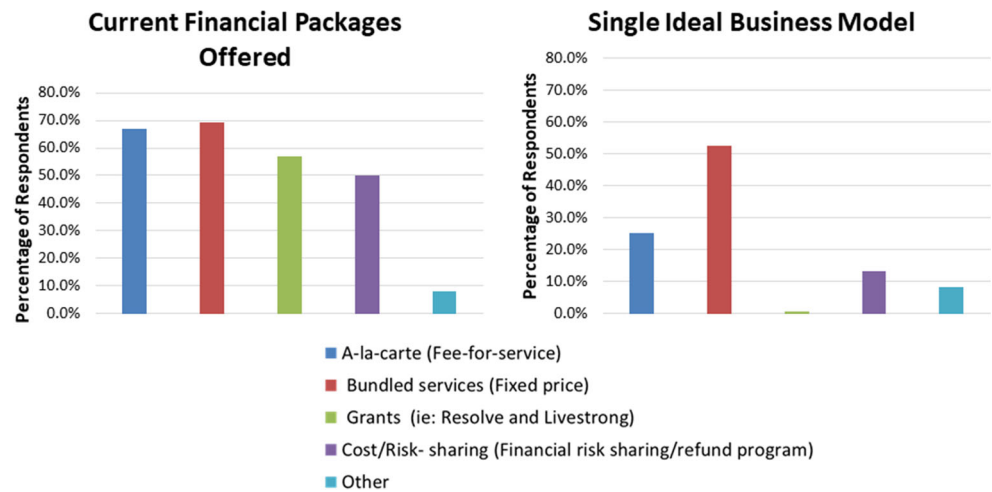
State-mandated IVF coverage

The majority of respondents (81%) practice in states without state-mandated IVF coverage. Most respondents (54%) have less than 25% of patients with insurance that covers IVF. Only 7% of respondents have greater than 75% of their patients with insurance that covers IVF. More fresh IVF cycles are being performed in states with mandated IVF coverage (mean = 839) compared to those without mandated coverage (mean = 381; *p* = 0.004). Also, more FET are performed in states with mandated IVF coverage (mean = 491) compared to those without mandated coverage (mean = 226; *p* = 0.01). There was no statistically significant association between state-mandated coverage and financial package offered.

Barriers to care

In states without state-mandated IVF coverage, cost is the largest barrier to care (99%). In states with state-mandated coverage, the largest barrier is still uncovered costs (94%).

Fig. 1 Current financial packages offered and single ideal business model: most respondents utilize bundled services and a-la-carte services and believe bundled services to be a single ideal business model



To a lesser extent, respondents practicing in states both with and without state-mandated insurance acknowledge other barriers including accommodation (i.e., patient too busy with other commitments), availability (i.e., difficulty getting an appointment), and accessibility (too far/long to get to the clinic) (Table 4).

Physician satisfaction

The majority of respondents are satisfied with their business model (75%). Male respondents and respondents in private practice are more likely to be satisfied with their current business model (85% of males vs 62% of females; $p = 0.001$). Eighty-eight percent of private practice respondents were satisfied compared to 55% of academic practice respondents ($p < 0.001$). Those satisfied with their current business model perform a higher number of FET/year (mean = 318), compared to those not satisfied (mean = 153; $p = 0.04$). The number of fresh IVF cycles was increased for those who reported being satisfied, but the difference was not significant when compared to those that were not satisfied. More satisfied

respondents are offering bundled services compared to those that are not satisfied (83% vs 59%; $p = 0.003$). Similarly, more satisfied respondents offer grants compared to those that are not satisfied (35% vs 16%; $p = 0.02$). There was no association with satisfaction and state-mandated coverage (18% vs 21%; $p = 0.66$). Overall, physician satisfaction was associated with private practice [OR (95%CI)] = [3.8 (1.7, 8.6)], male gender [OR (95%CI)] = [2.4 (1.1, 5.4)], and offering bundled services [OR (95%CI)] = [2.8 (1.2, 6.7)].

If not satisfied, why not?

Respondents that are not satisfied with their practice commented on common themes including too much administrative work, bureaucracy, academics, institutional decisions that are not in line with practices' best interest, not enough support staff, high cost, lack of insurance for patients, poor reimbursement, high overhead, and not enough financial package options for patients.

Discussion

While success rates with IVF have increased over the years, so too has the cost, especially in cycles with adjuvant procedures [2, 7]. IVF centers are utilizing a variety of models to help mitigate the cost to serve both the needs of the patient and the physicians. Those business practice models include a-la-carte pricing (fee-for-service), bundled services (fixed cost), cost/risk-sharing (financial risk-sharing/refund program), and use of insurance and grants. We found state-mandated insurance mitigates, but does not eliminate cost as the major barrier to care.

Numerous financial packages are offered regardless of mandated coverage [3]. In 2011, Jain reported that 37 states without mandated coverage provided services primarily on a fee-for-service basis [8]. Our results demonstrate that the

Table 3 Among the 131 who report their practice offers bundled services, what is included?

Services	Percentage including
Ultrasound exams	95.4%
Laboratory fees	93.1%
Medications	13.7%
Oocyte retrieval	97.7%
Embryo transfer	95.4%
Intracytoplasmic sperm injection	68.7%
Assisted hatching	65.6%
Pre-implantation genetic testing	23.7%
Anesthesia	55.0%
Other	5.3%

Table 4 Barriers to care with and without state-mandated IVF coverage ($n = 171$)

Barrier	With state-mandated coverage ($n = 33$)	Without state-mandated IVF coverage ($n = 138$)	<i>p</i> value
Costs	93.9%	99.3%	0.17
Accommodation (i.e., patient too busy with other commitments)	18.2%	13.0%	0.42
Availability (i.e., difficulty getting appointment)	9.1%	10.1%	1
Accessibility (i.e., too far/long to get to clinic)	15.2%	22.5%	0.48
Other	15.2%	2.2%	0.007

majority of respondents are offering bundled services, with the second most common being a-la-carte pricing. The majority believe bundled services to be the single ideal business model. Most that offer bundled services include an expansive package with a minority including medications and PGT. The higher volume clinics are offering bundled services, cost/risk-sharing, and grants.

The high cost and uncertainty in IVF have given rise to cost/risk-sharing programs, including financial risk-sharing or refund programs. Levy et al. compared the results of women treated through a risk-sharing program with those utilizing fee-for-service. They found that if a patient has a live birth after one cycle, the price would be greater for fee-for-service, after two cycles the prices would be equivalent and after three cycles, the couple would save money using a risk-sharing program. They also noted high patient satisfaction with the risk-sharing program [9]. Stassart et al. also reported their initial experience with an uncomplicated risk-sharing program in women less than 35 years of age. The program included the cost of medications and provided a full refund if no live birth occurred. In 2006, their risk-sharing program cost \$25,000, representing essentially the same revenue if all the services had been provided as fee-for-service and double that amount charged to a patient for a single fresh IVF cycle [10]. A recent news article highlighted a cost-sharing program where three women split 21 eggs from a single donor and discussed that such business models are changing the American family in “new and unpredictable ways” [11].

ASRM reviewed the ethics of “risk-sharing” in a committee opinion statement. They concluded that it is an option that maybe ethically offered to patients when criteria for enrollment and success is clearly stated; there is full disclosure of advantages, disadvantages, and alternatives; and the program operates within the ASRM practice guidelines [5]. We found that 50% of respondents are employing the cost/risk-sharing programs in their practice, but only 17% believe this to be the ideal business model. Physicians in solo practice are less likely to offer cost/risk-sharing. There is little published literature about the percentage of patients receiving a refund from this model. One company’s case series reported that 20% of the patients received a refund when they did not conceive [12]. Our study shows that the majority (58%) give a refund to less

than 5% of their patients. Future studies are needed to assess clinic requirements for eligibility into their cost/risk-sharing program and its effect on increasing access to care for patients.

The association between state-mandated coverage and practice patterns including a tendency for lower number of embryos transferred and a lower multiple birth rate has been well documented [8]. Our study confirms that a greater number of IVF cycles and FETs are being performed in states with mandated IVF coverage and is consistent with prior reports that state-mandated coverage has been shown to increase approximately threefold the utilization of infertility services [13]. However, we did not find any association between different financial packages offered in states with versus without mandated IVF coverage. There are differences in IVF practices in states with versus without mandated insurance coverage, but no differences in the business models utilized.

Physician satisfaction

In our study, 74% reported being satisfied with their current practices business model. When asked about the reason if they were not satisfied, answers included common themes involving institutional bureaucracy, cost, not enough support staff, and academics. Barnhart et al. found a high degree of professional satisfaction and morale in the field with the most satisfying part of the job being patient interactions and the least satisfying part of the job being the work schedule [4]. We report that being satisfied with the practices’ business model was associated with male gender, private practice, and offering bundled services. It is logical that those physicians offering bundled services are more satisfied as they can focus on providing the best care for the patient with less concern on the exact cost to that patient for individual interventions. Gender differences in facets of career satisfaction have been evaluated previously [14, 15]. One study reported high overall career satisfaction for men and women, but when compared to men, women were less satisfied with career-advancement opportunities, recognition, and salary [14]. The significance of our findings is unclear, but women and those practicing in academic practice are less satisfied with their current business model. Although respondents were specifically asked about physician satisfaction with their business model, we do

recognize that factors not associated with payment types could have affected this such as satisfaction with other components of their job.

Limitations

The limitations of this study arise from this being an anonymous survey. Multiple physicians from one practice could have potentially responded to the survey. If so, the reflection of business models across the country could be skewed. However, physicians from the same clinic may have diverse perspectives on the business. In an attempt to keep to the survey anonymous, clinic information was not obtained. Also, respondents were asked what services they offered, and not whether the patient actually utilized that service. Potentially, this could have yielded different responses. The response rate is 30% which is relatively low, but similar to another published SREI survey [4]. As discussed by Barnhart et al., response rates for workforce surveys are often low because physicians are busy or there is a fear of sharing personal information [4]. We also chose to limit the number of questions to 30 to balance response rates and information acquired as greater than 25–30 questions can discourage respondents [16].

Another limitation is the definition of “state-mandated coverage,” which varies by state in terms of eligibility, amount of money allocated, and mandate to “offer” versus “cover.” For example, California excludes IVF but covers gamete intrafallopian tube transfer, Arkansas limits IVF coverage to a lifetime maximum of \$15,000 if all other criteria or meet, and Illinois and Maryland allow businesses with 25 or 50 or fewer employees, respectively, to be exempt from providing IVF coverage [17]. More studies are needed to delineate details on state-mandated coverage, different business models to address uncovered costs, and financial viability. The strengths of this study included utilization of a well-respected national group of physicians, good statistical design, and the novel information yielded.

Conclusion

Building a family with IVF is a financial challenge. Physicians believe that cost is the major barrier to care in states with and without mandated coverage. Physicians utilize a variety of business models and most are satisfied with their current model. Larger-volume clinics utilize bundled services, cost/risk-sharing, and grants. Higher physician satisfaction was associated with private practice, male gender, and offering bundled services.

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Compliance with ethical standards

This article does not contain any studies with human participants or animals performed by any of the authors.

Conflicts of interest The authors declare that they have no conflict of interest.

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