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The Prevalence of No-Shows and Cancellations Rate in Outpatient Physical Therapy Practice and Its Relationship to Age and Gender

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ABSTRACT

Background: No-Show and late canceled appointments significantly impact out-patient Physical therapist productivity, patient clinical outcomes, and the clinic's revenue-generating capacity. No-show and appointment cancelation cost the out-patient Physical Therapy practice in this case study $114,505.58CAD in 2017. This study seeks to understand, identify, and provide solutions unique to our local setting for the problem of no-shows and appointment cancellation.

Methods: This study uses the 2017 de-identified patient's attendance records of an out-patient Physical Therapy clinic in Calgary, Canada. Patient data, including sex, age, scheduled appointment, no-show, and cancellation history, were examined. The data were analyzed using chi-square to determine any significant differences in attendance patterns among these groups.

Results: A total of 6,162 scheduled appointments were aggregated from the EHR. The overall no-show and cancelation was 20.6%. Male had a slightly higher rate of no-show/cancelation (20.8%) versus females (20.6%), which was not statistically significant ($p = 0.734$). In the adult age groups, no-show and cancelation rates were highest for 12-20y/o (31.4%), 21-30y/o (31.3%), and 41-50y/o (22.3%). These groups accounted for 50.6% of total revenue loss. There was a significant overall difference among the age groups ($p < 0.0001$) in no-show/cancelation. The top four reasons for no-show and cancellation include forgetting the appointment, family and personal emergency, lack of transportation, and a scheduling conflict with another equally important appointment.

Conclusion: Evidence indicates that no-show and appointment cancelation rates are high in Canadian health institutions leading to poor productivity, inefficiency, and revenue loss. This study seeks to provide an evidence-based intervention.

Keywords: No-show, cancellation rate, missed appointment, physical therapy, out-patient.

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INTRODUCTION

The problem of no-show and appointment cancellation is global in its prevalence and cut across all health and medical specialty practices [1, 5, 12], leading to significant system inefficiency, loss of productivity, and potential revenue generation [1, 2, 3, 4, 5].

Dantas et al. (2018), in their study, indicate that the average no-show rate is of the order of 23%, being highest in the African continent (43.0%) and lowest in Oceania (13.2%). North America had 23.5% and Europe's 19.3% no-show rate. In the same study by Dantas et al. (2018), the no-show rate is highest in Physiotherapy, with a median no-show rate of 57.3%. Endocrinology 36.0%, Cardiology 30.0%, Pediatrics 17.0%. In their study, Shuja et al. (2017) showed that no-show incidence in GI endoscopy unit is as high as 29%, with a significant correlation to race, gender, marital status, and insurance [6]. No-show and appointment cancelation is also prevalent in other out-patient facilities, including radiology, audiology, gastrointestinal unit, ophthalmology, and mental health [7,8,12].

Missed appointments are a significant impediment to clinic productivity, efficiency, patient outcome, and revenue-generating potentials of the clinic [3,4,7]. Clinic productivity and efficiency decline with every no-show and appointment cancelation [1,9]. A missed appointment is a clinical conundrum that has severe implications on outcomes. When patients miss their appointments, there is a break in the continuum of care, which affects the overall outcomes. It is also a breach of trust that would have been established between patients and their care providers. Mbada et al. (2012), in their study, have shown missed appointments to adversely prolonged recovery time for patients [3]. Mbada et al. (2012) calculated the effect of missed appointment in a clinic with 79.2% missed appointment rate and stated that patient recovery time could be 1774 days due to missed appointments [3]. Hammersley et al. (1985) stated that appointment defaulters often receive minimal medical supervision than patients who regularly keep their appointment, prolonging their healing time or exacerbating other co-morbidity relating to their clinical diagnosis [14].

Missed appointments also have a significant drag on the potential for revenue generation of out-patient Physical therapy. Many studies have shown the cost of missed appointments in many out-patient clinics. Avitzur (2003) described the result of the analyses of the no-show's economic consequences by an administrator of 13-member neurology practice. He calculated the cost to the practice as over $131,000 in unrealized income [10]. Guzek et al. (2015) estimated the yearly reimbursement loss because of missed appointments in their pediatric neurology clinic with a 26% no-show rate of $257,724.57 during the July 2013 to June 2014 academic year [1]. Million of dollars in loss of revenue potentials have been reported by many authors, estimated cost in potential revenue ranges between hundreds of thousands to millions of dollars depending on the clinical settings. [7, 9, 10, 11] In the US, the economic impact of missed appointments on the entire healthcare industry could be as high as $150 billion annually [16].

The common reasons for missed appointments have been readily identified in the literature, including patients forgetting the appointment, personal and family emergency, inability to get time off work, scheduling conflict with equally essential appointments, and weather condition. This is simply due to the loss of interest in attending the scheduled appointment [15, 16, 17, 18, 19]. Other reasons for missed appointments include the patient's medical history; for example, evidence suggests that patients with a history of depression are more likely to miss their appointment. In contrast, patients with a history of HIV are less likely to miss appointment. [4, 7] Many solutions including Short Message System (SMS) and reminder call, [2, 20] written missed appointment policy, [10] and overbooking [15] have been proposed to mitigate no-show and appointment cancellation. Studies have confirmed SMS and reminder phone calls' effectiveness in reducing missed appointment episodes, however, to varying degrees of success [20,21]. Overbooking is a strategy that often leads to an un-intended consequence of a prolonged wait time for compliant patients and lower than expected revenue for the clinic. [22] Poor patient experience, pressure on staff, provider over time, and suboptimal care are other unintended consequences of overbooking [23]. Instituting and enforcing a written no-show policy that includes a missed appointment fee has also shown a mixed result. In one study, a facility charged $200 for a cancellation fee; this was sufficiently large enough to scare patients to attending their appointment, but also has the potential to scare patients away altogether; the clinic eventually stopped enforcing cancellation fees [24].

The literature review provides evidence that missed appointments, including no-shows and cancellation, is an ongoing and serious problem facing all healthcare specialties, including Physical Therapy. The enormity of the economic burden on out-patient facilities, including the one in this case study, requires urgent intervention. Negative consequences on patient care outcomes such as extended recovery time, poor healing, and maladaptive disorders are challenging to quantify in pecuniary measure. The purpose of this case report is to describe the development and demonstrate the implementation of evidence-based interventions aim at reducing the rate of no-shows and appointment cancellation in my out-patient Physical Therapy clinic.

Case Description: Target Setting

METHOD

Population and Data aggregation:

Stargate Physical Therapy Inc. is an out-patient Physical Therapy practice located in Calgary's metropolitan city with a population of approximately 1.2 million. The facility sees mostly musculoskeletal caseload, including motor vehicle collision and work-related injuries. The data used in this case study include de-identified attendance

records between January to December 2017. Patient data, including sex, age, scheduled appointment, no-show, and cancellation history, were examined. In this study, no-show and appointment cancellation may be collectively referred to as Missed appointments. For clarity's sake, "no-show" means when a patient misses an appointment without any attempt to contact the clinic for cancellation. In contrast, "appointment cancellation" means a scenario whereby a patient canceled the scheduled appointment via telephone system or email within 24 hours of the appointment.

A total aggregated scheduled appointment was 6,162 distributed among three Physical therapists (one full-time, two part-time) and one part-time chiropractors. The EHR used by the clinic aggregated the missed appointment and loss revenue data. The data were aggregated across gender and age groups. The gender identification for this study was male and female, the age groups were: 0-11, 12-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, and 81-99+. Table 1-3 below shows the aggregated data for a number of no-shows, time loss, and revenue loss, respectively. In table 6, the aggregated dollar amount was generated based on the predetermined charges per visit and the third-party payers. Please, see table 4 below for the detail of charges for different cases and payers.

Table 1: Number of No Shows/Cancellations January – December 2017

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total - Client	**74**	**121**	**136**	**103**	**135**	**109**	**95**	**98**	**80**	**134**	**88**	**97**	**1270**
PT 1 (Part time)	0	0	0	0	0	2	11	15	7	0	4	20	**59**
PT 2 (Part time)	8	20	23	29	28	24	20	32	15	38	7	0	**244**
PT 3 (Full time)	66	101	113	74	107	82	63	50	58	93	73	69	**949**
Chiropractor (Part time)	0	0	0	0	0	1	1	1	0	3	4	8	**18**
Total - Professional	**74**	**121**	**136**	**103**	**135**	**109**	**95**	**98**	**80**	**134**	**88**	**97**	**1270**
Female	30	61	60	40	56	53	44	47	44	82	48	44	**609**
Male	44	60	76	63	79	56	51	51	36	52	40	53	**661**
Total - Gender	**74**	**121**	**136**	**103**	**135**	**109**	**95**	**98**	**80**	**134**	**88**	**97**	**1270**
0 --> 11	1	2	3	1	0	4	8	0	0	0	0	0	**19**
12 --> 20	2	3	0	0	6	8	8	20	10	22	4	6	**89**
21 --> 30	12	17	26	23	26	14	24	9	14	13	10	2	**190**
31 --> 40	13	15	18	7	20	19	12	12	11	23	19	28	**197**
41 --> 50	22	32	51	33	44	30	16	26	18	25	32	31	**360**
51 --> 60	15	33	21	25	29	19	17	16	14	32	13	23	**257**
61 --> 70	5	13	15	12	7	11	5	11	12	6	6	4	**107**
71 --> 80	3	2	2	1	2	3	3	1	1	9	1	2	**30**
81 --> 99 +	1	4	0	1	1	1	2	3	0	4	3	1	**21**
Not specified	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total - Age Group	**74**	**121**	**136**	**103**	**135**	**109**	**95**	**98**	**80**	**134**	**88**	**97**	**1270**
Male 0 --> 11	0	2	1	1	0	2	4	0	0	0	0	0	**10**
Male 12 --> 20	1	2	0	0	6	8	5	15	5	9	2	6	**59**
Male 21 --> 30	7	13	19	17	23	12	15	6	4	7	5	1	**129**
Male 31 --> 40	5	5	7	3	9	7	4	6	7	9	10	20	**92**
Male 41 --> 50	15	15	31	23	29	19	11	9	8	9	12	15	**196**
Male 51 --> 60	8	11	7	11	8	4	6	5	4	7	5	8	**84**
Male 61 --> 70	5	10	9	7	3	4	4	7	8	3	5	2	**67**
Male 71 --> 80	3	2	2	0	1	0	1	1	0	4	1	0	**15**
Male 81 --> 99 +	0	0	0	1	0	0	1	2	0	4	0	1	**9**
Total - Gender Male	**44**	**60**	**76**	**63**	**79**	**56**	**51**	**51**	**36**	**52**	**40**	**53**	**661**
Female 0 --> 11	1	0	2	0	0	2	4	0	0	0	0	0	**9**
Female 12 --> 20	1	1	0	0	0	0	3	5	5	13	2	0	**30**
Female 21 --> 30	5	4	7	6	3	2	9	3	10	6	5	1	**61**
Female 31 --> 40	8	10	11	4	11	12	8	6	4	14	9	8	**105**
Female 41 --> 50	7	17	20	10	15	11	5	17	10	16	20	16	**164**
Female 51 --> 60	7	22	14	14	21	15	11	11	10	25	8	15	**173**
Female 61 --> 70	0	3	6	5	4	7	1	4	4	3	1	2	**40**
Female 71 --> 80	0	0	0	1	1	3	2	0	1	5	0	2	**15**
Female 81 --> 99 +	1	4	0	0	1	1	1	1	0	0	3	0	**12**
Total - Gender Female	**30**	**61**	**60**	**40**	**56**	**53**	**44**	**47**	**44**	**82**	**48**	**44**	**609**
Table 4: Number of No Shows/Cancellations January - December 2017													

Table 2: Total Time-Lost (hours) January – December 2017

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total(t)
Total - Client	**39.67**	**67.08**	**70.00**	**51.58**	**69.58**	**58.00**	**48.17**	**52.00**	**42.58**	**64.25**	**41.50**	**46.58**	**651.00**
PT 1 (Part time)	0.00	0.00	0.00	0.00	0.00	1.50	5.50	7.50	4.08	0.00	1.58	9.58	**29.75**
PT 2 (Part time)	4.00	11.50	12.50	14.50	15.00	13.00	10.00	18.00	7.50	20.00	3.50	0.00	**129.50**
PT 3 (Full time)	35.67	55.58	57.50	37.08	54.58	43.00	32.17	26.00	31.00	42.75	34.42	33.00	**482.75**
Chiropractor (Part tim	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.50	0.00	1.50	2.00	4.00	**9.00**
Total - Professional	**39.67**	**67.08**	**70.00**	**51.58**	**69.58**	**58.00**	**48.17**	**52.00**	**42.58**	**64.25**	**41.50**	**46.58**	**651.00**
Female	17.58	33.08	30.50	20.00	29.00	29.00	22.17	24.50	24.58	39.50	24.25	21.17	**315.33**
Male	22.08	34.00	39.50	31.58	40.58	29.00	26.00	27.50	18.00	24.75	17.25	25.42	**335.67**
Total - Gender	**39.67**	**67.08**	**70.00**	**51.58**	**69.58**	**58.00**	**48.17**	**52.00**	**42.58**	**64.25**	**41.50**	**46.58**	**651.00**
0 --> 11	1.00	2.00	1.50	0.50	0.00	2.00	4.00	0.00	0.00	0.00	0.00	0.00	**11.00**
12 --> 20	1.00	1.50	0.00	0.00	4.00	4.00	4.00	10.50	6.50	11.58	1.58	2.58	**47.25**
21 --> 30	6.58	10.00	14.00	11.08	13.00	7.00	11.58	4.50	8.50	6.50	6.00	1.00	**99.75**
31 --> 40	7.08	8.00	9.50	3.50	10.08	11.50	6.50	6.50	5.50	9.83	9.67	13.17	**100.83**
41 --> 50	11.50	17.00	26.00	16.50	22.00	15.50	8.00	13.50	9.00	12.08	13.50	15.25	**179.83**
51 --> 60	7.50	18.00	10.50	12.50	15.00	9.50	9.00	8.00	6.58	14.75	6.08	11.50	**128.92**
61 --> 70	2.50	6.50	7.50	6.00	3.50	6.00	2.50	5.50	6.00	3.00	3.00	2.00	**54.00**
71 --> 80	1.50	1.00	1.00	0.50	1.00	1.50	1.50	0.50	0.50	4.50	0.50	0.58	**14.58**
81 --> 99 +	1.00	3.08	0.00	1.00	1.00	1.00	1.08	3.00	0.00	2.00	1.17	0.50	**14.83**
Not specified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**

Total - Age Group	39.67	67.08	70.00	51.58	69.58	58.00	48.17	52.00	42.58	64.25	41.50	46.58	651.00
Male 0 --> 11	0.00	2.00	0.50	0.50	0.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	6.00
Male 12 --> 20	0.50	1.00	0.00	0.00	4.00	4.00	2.50	8.00	2.50	4.08	0.58	2.58	29.75
Male 21 --> 30	3.08	8.00	10.00	8.08	11.50	6.00	7.50	3.00	2.00	3.50	2.50	0.50	65.67
Male 31 --> 40	2.50	3.00	4.00	1.50	4.58	4.00	2.00	3.50	3.50	4.08	5.17	9.17	47.00
Male 41 --> 50	8.00	8.00	16.00	11.50	14.50	10.00	5.50	4.50	4.00	4.08	3.92	7.67	97.67
Male 51 --> 60	4.00	6.00	3.50	5.50	4.00	2.00	3.00	2.50	2.00	3.50	2.08	4.00	42.08
Male 61 --> 70	2.50	5.00	4.50	3.50	1.50	2.00	2.00	3.50	4.00	1.50	2.50	1.00	33.50
Male 71 --> 80	1.50	1.00	1.00	0.00	0.50	0.00	0.50	0.50	0.00	2.00	0.50	0.00	7.50
Male 81 --> 99 +	0.00	0.00	0.00	1.00	0.00	0.00	1.00	2.00	0.00	2.00	0.00	0.50	6.50
Total - Gender Male	22.08	34.00	39.50	31.58	40.58	29.00	26.00	27.50	18.00	24.75	17.25	25.42	335.67
Female 0 --> 11	1.00	0.00	1.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	0.00	5.00
Female 12 --> 20	0.50	0.50	0.00	0.00	0.00	0.00	1.50	2.50	4.00	7.50	1.00	0.00	17.50
Female 21 --> 30	3.50	2.00	4.00	3.00	1.50	1.00	4.08	1.50	6.50	3.00	3.50	0.50	34.08
Female 31 --> 40	4.58	5.00	5.50	2.00	5.50	7.50	4.50	3.00	2.00	5.75	4.50	4.00	53.83
Female 41 --> 50	3.50	9.00	10.00	5.00	7.50	5.50	2.50	9.00	5.00	8.00	9.58	7.58	82.17
Female 51 --> 60	3.50	12.00	7.00	7.00	11.00	7.50	6.00	5.50	4.58	11.25	4.00	7.50	86.83
Female 61 --> 70	0.00	1.50	3.00	2.50	2.00	4.00	0.50	2.00	2.00	1.50	0.50	1.00	20.50
Female 71 --> 80	0.00	0.00	0.00	0.50	0.50	1.50	1.00	0.00	0.50	2.50	0.00	0.58	7.08
Female 81 --> 99 +	1.00	3.08	0.00	0.00	1.00	1.00	0.08	1.00	0.00	0.00	1.17	0.00	8.33
Total - Gender Female	17.58	33.08	30.50	20.00	29.00	29.00	22.17	24.50	24.58	39.50	24.25	21.17	315.33
Table 5: Time Lost (Hours) January - December 2017													

Table 3: Loss of Revenue (CAD) January - December 2017

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total$
Total - Client	6402.62	10738.24	12539.31	9409.00	12376.31	10065.93	8688.44	8952.44	7319.88	11735.37	7531.60	8746.44	114505.58
PT 1 (Part time)	0.00	0.00	0.00	0.00	0.00	158.72	922.72	1345.00	608.72	0.00	291.72	1897.00	5223.88
PT 2 (Part time)	681.00	1804.31	1971.31	2658.00	2564.31	2187.33	1920.00	2855.44	1415.00	3424.44	610.00	0.00	22091.14
PT 3 (Full time)	5721.62	8933.93	10568.00	6751.00	9812.00	7619.88	5745.72	4652.00	5296.16	8010.93	6229.88	6102.44	85443.56
Chiropractor (Part tim	0.00	0.00	0.00	0.00	0.00	100.00	100.00	100.00	0.00	300.00	400.00	747.00	1747
Total - Professional	6402.62	10738.24	12539.31	9409.00	12376.31	10065.93	8688.44	8952.44	7319.88	11735.37	7531.60	8746.44	114505.58
Female	2638.31	5300.62	5524.00	3716.00	5203.00	5036.72	3966.72	4184.44	4077.72	7328.72	4253.16	4159.72	55389.13
Male	3764.31	5437.62	7015.31	5693.00	7173.31	5029.21	4721.72	4768.00	3242.16	4406.65	3278.44	4586.72	59116.45
Total - Gender	6402.62	10738.24	12539.31	9409.00	12376.31	10065.93	8688.44	8952.44	7319.88	11735.37	7531.60	8746.44	114505.58
0 --> 11	117.00	234.00	249.00	83.00	0.00	400.00	749.00	0.00	0.00	0.00	0.00	0.00	1832
12 --> 20	183.00	249.00	0.00	0.00	600.00	731.00	783.00	1881.00	1017.00	1994.00	314.00	482.00	8234
21 --> 30	1055.00	1553.00	2496.00	2110.00	2283.31	1184.44	2118.00	780.00	1360.00	1182.00	945.00	183.00	17249.75
31 --> 40	1067.31	1325.00	1625.00	649.00	1791.00	1665.88	990.44	1148.00	839.16	1822.16	1587.16	2493.00	17003.11
41 --> 50	1891.00	2728.00	4777.00	3042.00	4028.00	2854.61	1549.00	2226.00	1671.00	2245.72	2647.44	2771.72	32431.49
51 --> 60	1287.31	2930.93	1830.31	2311.00	2766.00	1865.00	1590.00	1410.44	1211.72	2765.44	1160.00	2225.00	23353.15
61 --> 70	420.00	1134.31	1362.00	1069.00	608.00	1022.00	500.00	1100.00	1121.00	600.00	583.00	400.00	9919.31
71 --> 80	265.00	183.00	200.00	50.00	183.00	248.00	264.00	100.00	100.00	900.00	100.00	150.00	2743
81 --> 99 +	117.00	401.00	0.00	95.00	117.00	95.00	145.00	307.00	0.00	226.05	195.00	41.72	1739.77
Not specified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Total - Age Group	6402.62	10738.24	12539.31	9409.00	12376.31	10065.93	8688.44	8952.44	7319.88	11735.37	7531.60	8746.44	114505.58
Male 0 --> 11	0.00	234.00	83.00	83.00	0.00	200.00	383.00	0.00	0.00	0.00	0.00	0.00	983
Male 12 --> 20	100.00	166.00	0.00	0.00	600.00	731.00	500.00	1466.00	500.00	850.00	150.00	482.00	5545
Male 21 --> 30	599.00	1221.00	1797.00	1510.00	2000.31	984.44	1348.00	515.00	383.00	672.00	455.00	100.00	11584.75
Male 31 --> 40	404.31	517.00	649.00	249.00	781.00	524.16	287.72	566.00	490.16	682.44	880.00	1711.00	7741.79
Male 41 --> 50	1312.00	1259.00	2893.00	2110.00	2681.00	1824.61	1100.00	804.00	783.00	774.72	805.44	1332.00	17678.77
Male 51 --> 60	664.00	970.31	544.31	997.00	711.00	382.00	508.00	427.00	337.00	501.44	405.00	720.00	7167.06
Male 61 --> 70	420.00	887.31	849.00	649.00	300.00	383.00	400.00	700.00	749.00	300.00	483.00	200.00	6320.31
Male 71 --> 80	265.00	183.00	200.00	0.00	100.00	0.00	100.00	100.00	0.00	400.00	100.00	0.00	1448
Male 81 --> 99 +	0.00	0.00	0.00	95.00	0.00	0.00	95.00	190.00	0.00	226.05	0.00	41.72	647.77
Total - Gender Male	3764.31	5437.62	7015.31	5693.00	7173.31	5029.21	4721.72	4768.00	3242.16	4406.65	3278.44	4586.72	59116.45
Female 0 --> 11	117.00	0.00	166.00	0.00	0.00	200.00	366.00	0.00	0.00	0.00	0.00	0.00	849
Female 12 --> 20	83.00	83.00	0.00	0.00	0.00	0.00	283.00	415.00	517.00	1144.00	164.00	0.00	2689
Female 21 --> 30	456.00	332.00	699.00	600.00	283.00	200.00	770.00	265.00	977.00	510.00	490.00	83.00	5665
Female 31 --> 40	663.00	808.00	976.00	400.00	1010.00	1141.72	702.72	582.00	349.00	1139.72	707.16	782.00	9261.32
Female 41 --> 50	579.00	1469.00	1884.00	932.00	1347.00	1030.00	449.00	1422.00	888.00	1471.00	1842.00	1439.72	14752.72
Female 51 --> 60	623.31	1960.62	1286.00	1314.00	2055.00	1483.00	1082.00	983.44	874.72	2264.00	755.00	1505.00	16186.09
Female 61 --> 70	0.00	247.00	513.00	420.00	308.00	639.00	100.00	400.00	372.00	300.00	100.00	200.00	3599
Female 71 --> 80	0.00	0.00	0.00	50.00	83.00	248.00	164.00	0.00	100.00	500.00	0.00	150.00	1295
Female 81 --> 99 +	117.00	401.00	0.00	0.00	117.00	95.00	50.00	117.00	0.00	0.00	195.00	0.00	1092
Total - Gender Female	2638.31	5300.62	5524.00	3716.00	5203.00	5036.72	3966.72	4184.44	4077.72	7328.72	4253.16	4159.72	55389.13
Table 6: Loss of Revenue (CAD) January - December 2017													

Table 4: Fee schedule in Canadian Dollar

Type of Injury	Fees
MVA Assessment	$117.00
MVA Treatment	$82.00
MVA Section B Assessment	$150.00
MVA Section B Treatment	$120.00
Worker's Comp Assessment	$71.00
Worker's Comp Treatment	$41.00
Private Assessment	$105.00
Private Treatment	$95.00

Analysis:

The aggregated data of visits was stored in Microsoft Excel spreadsheets, and all analyses were conducted using IBM SPSS Version 25. The statistical analysis examined frequency distributions and appointment outcome rates for the clinic between January to December 2017 by type of provider, gender, and age groups. Chi-square statistics were calculated, and P values were obtained to test differences in no-show rates and cancellation between genders and age groups. A total of 6,162 scheduled appointments were aggregated from the EHR. The overall no-show and cancelation was 20.6% (1270). Male had a slightly higher rate of no-show/cancelation of 20.8 %(661) versus females 20.4% (609), which was not statistically significant (p = 0.734). In the age groups, no-show and cancelation rates were highest for 12-20y/o (31.4%), 21-30y/o (31.3%), and 41-50y/o (22.3%). These groups accounted for 50.6% of total revenue loss. There was a significant overall difference among the age groups (p < 0.0001) in no-show/cancelation. (See table 5a,5b, 6a, 6b and Figure 1, 2)

Row * Column Crosstabulation

			Column		
			No Show / Cancellation	Attended	Total
Row	Female	Count	609	2372	2981
		% within Row	20.4%	79.6%	100.0%
	Male	Count	661	2520	3181
		% within Row	20.8%	79.2%	100.0%
Total		Count	1270	4892	6162
		% within Row	20.6%	79.4%	100.0%

Table 5a: No-show / Cancellation Rates across gender

Row * Column Crosstabulation

	Age Groups		Column		
			Attended	No Show / Cancellation	Total
Row	0-11	Count	54	19	73
		% within Row	74.0%	26.0%	100.0%
	12-20	Count	194	89	283
		% within Row	68.6%	31.4%	100.0%
	21-30	Count	420	190	610
		% within Row	68.9%	31.1%	100.0%
	31-40	Count	795	197	992
		% within Row	80.1%	19.9%	100.0%
	41-50	Count	1257	360	1617
		% within Row	77.7%	22.3%	100.0%
	51-60	Count	1418	257	1675
		% within Row	84.7%	15.3%	100.0%
	61-70	Count	654	107	761
		% within Row	85.9%	14.1%	100.0%
	71-80	Count	94	30	124
		% within Row	75.8%	24.2%	100.0%
	81-99	Count	6	21	27
		% within Row	22.2%	77.8%	100.0%
Total		Count	4892	1270	6162
		% within Row	79.4%	20.6	100.0%

Table 5b: No-show/Cancellation rate among age groups

Chi-Square Tests

	Value	df	Asymp. Sig (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.115[a]	1	.734		
Continuity Correction[b]	.095	1	.758		
Likelihood Ratio	.115	1	.734		
Fisher's Exact Test				.753	.379
Linear-by-Linear Associaton	.115	1	.734		
N of Valid Cases	6162				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 614.39.

b. Computed only for a 2x2 table

Table 6a: Chi-Square Tests results across genders

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	169.316[a]	8	.000
Likelihood Ratio	153.567	8	.000
Linear-by-linear Association	53.280	1	.000
N of Valid Cases	6162		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.56

Table 6b: Chi-Square tests results for age groups.

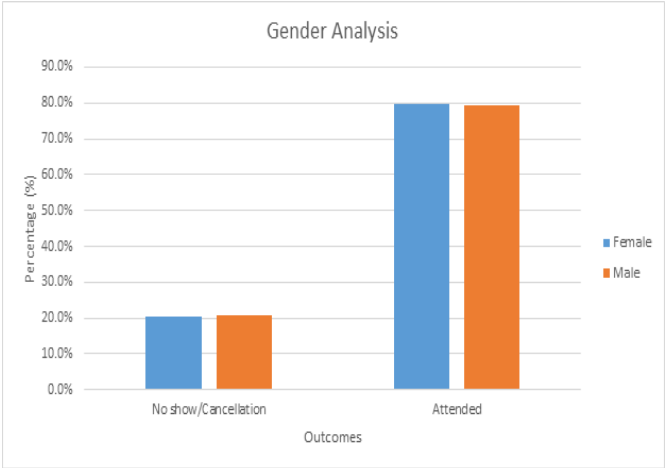

Figure 1: No-show/cancellation rate across the genders

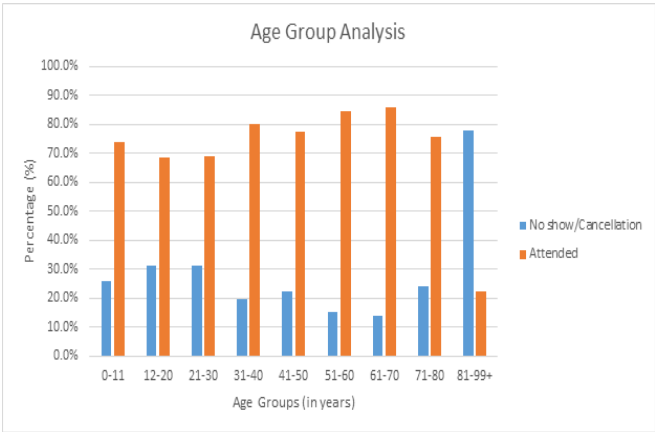

Figure 2: No-show/cancellation rate across the age groups.

RESULTS AND DISCUSSION:

The analysis of the data from the clinic EHR confirmed the evidence from the literature that no-show and cancellation are recurrent problems in the out-patient clinical practice. The results show that the rate of no-show and cancellation are slightly higher in male than female, although the difference is not statistically significant ($p = 0.74$); this confirmed the earlier studies that found gender not to be a statistically significant predictor of no-show. [4] Few other studies had also reported that men were more likely to miss their appointments than women [14,17].

In the age groups, no-show and cancelation rates were highest for 12-20y/o (31.4%), 21-30y/o (31.3%), and 41-50y/o (22.3%). These groups accounted for 50.6% of total revenue loss. There was a significant overall difference among the age groups ($p < 0.0001$) in no-show/cancelation. The attendance of scheduled appointments of patients in 0-11 and 81-99+ age groups is dependent on the availability of their significant other, either parent or caregiver; patients in these age groups accounted for 3.1% of unrealized revenue. Financial analysis indicates that males accounted for 51.6% of revenue totaling $59,116.45 that was never generated due to missed appointments; females accounted for 48.4% totaling $55,389.13.

Further analysis of our clinic database indicates that the top three reasons for no-shows and cancellation were illness, scheduling conflict, and forgetting the appointment. Bokinskie et al. (2015) had also identified these reasons for missed appointments in their study [18]. We identified other reasons for missed appointments: lack of transportation, work commitment, weather condition, and unforeseen travel expediency.

***Implication for the Clinic*:**

Our data analysis has shown that missed appointment is a recurrent issue negatively impacting the clinic's productivity, efficiency, and revenue generation potential. Evidence has also shown that the problem cuts across genders and age groups. The unrealized revenue potential means that the ability to hire more staff or add new products and services will be seriously hampered. Over $100,000 that was never generated due to no-shows and cancellation is a serious shortfall for a small business operating in an era of local and national economic downturn. The cost of running a business is skyrocketing year after year, and every dollar counts towards maintaining positive margins. From this case study, the clinic, in 2017, operated at a reduced efficiency of 20.6%. Over 650 allotted practice hours were lost due to missed appointments, thereby reducing the productivity of Physical Therapists and other professionals. It is in the economic interest of the clinic to design interventions aimed at reducing this problem. My immediate goal is to design an evidence-based solution that will reduce the rate of no-shows and cancellations from the current 20.6% to 5% between January 2019 to December 2021. At the end of December 2021, another study will be conducted to verify the interventions' outcomes.

Implication for the Patient:

Several studies have shown that No-shows and missed appointments have serious negative consequences on patient care outcomes. These consequences vary depending on the clinical setting. These adverse outcomes may include a change in the provider-patient dynamic leading to miscommunication, decreased empathy, and poor quality of care [18]. Nonattendance also has adverse effects on the psychiatric patients' population, increasing the risk of new hospitalization by up to 10% among patients attending follow-up appointments and up to 25% among those who fail to keep their appointment [25]. Failure to attend follow-up visits can also discourage patients from taking their medication, leading to serious health consequences [25]. Other studies have also suggested that missed appointment slows down patient's recovery time significantly [3,9,19]. Diabetic patients who missed their appointment received minimal medical supervision and consequently have higher morbidity than regular attenders at the clinic [14].

Implication for the third-party payers:

Insurance companies do not reimburse for no-shows and appointment cancellations because they aren't considered a medical necessity [30]. However, when we consider the evidence in the literature on the negative impact of missed appointments on patient outcomes, the payer may have been paying more to fix the medical complications down

the road. For example, a diabetic patient who is a regular no-show in his doctor appointment may sooner or later develop other complications of diabetes, which in turn increase the cost of managing those diabetes complications. Third parties, including payers' collaboration, will help in combating this problem.

Proposed intervention to reduce the missed appointment:

Since the top reasons for no-shows and cancellation are illness, scheduling conflict, forgetting the appointment. I will be proposing a multi-prong approach, including SMS, enforcement of written policy, and education such as posters.

1. Automated Short messaging system (SMS): This has been efficient in reducing no-show and cancellation episodes in different medical specialties [21]. Downer et al. (2005) found a reduction in nonattendance rates with the use of SMS reminders that ranged from 3% to 27% depending on the specialty studied. [2] Geraghty et al. (2008) report an 11% reduction in nonattendance rates at an ear, nose, and throat hospital.[23] This reminder approach can help patients that attribute their no-show to forgetfulness and scheduling conflict.
2. Enforcement of written no-show and cancellation policy: Although this approach has been shown to have mixed results, it is still necessary to put one in place for personal accountability purposes. The written document will contain an acceptable time frame to cancel a previously scheduled appointment, acceptable reasons for no-show and late cancellation such as personal and a family emergency, unanticipated illness such as flu and related health issue, severe weather in which the authority has issued a warning, etc. The policy should also emphasize the no-show fee and possibly the collection procedure. Staff training for enforcing the policy is also essential. This approach is likely to work better with patients who forgot their appointment and patients with a nonchalant attitude towards their appointment. The consequence of paying for a no-show fee may become a motivating factor for keeping their appointment. There is no consensus in the literature as to the fee amount significant enough to change patient behavior. The onus is on the facility to determine the no-show fee to meet their specific local need.
3. Patient education surrounding no-shows and cancellation: This has also been an effective approach to reducing missed appointment incidence. DuMontier et al. (2013) reported a significant drop in the no-show rate from 10% to 7.06%; in the study, medical receptionists and Physicians were trained on how to engage patients through a sustained education of patients on the negative impact of no-show on the care outcomes [24]. Another jurisdiction is using educational posters within the clinic setting to engage the patient [5]. A significant portion of our patients with a history of no-shows and appointment cancellation have smartphones, making it easier to engage with them through smart technology. I intend to develop a clinical app that will enhance our patients' education on a wide variety of topics, including no-shows and cancellation.

***Cost analysis of the intervention*:**

Monthly scheduled appointment x cost/text message = the monthly cost

At the current rate of scheduling of 800 appointment, the Total cost of SMS = 800 x 0.25cent = $200 monthly ($2400.00/yr.)

The estimated cost of educational posters: $400.00

The estimated cost of writing Missed appointment Policy: $200 (@ $100/hr.)

The estimated cost of staff training: $2500.00

The estimated total cost for the first year: = $2400 + $400 + $200 + $2500 = $5500.00.

The estimated total cost for year 2 of the intervention = $2400 (SMS fee)

The estimated total cost for the entire 2year program = $5500 + $2400 = $7900.00

The estimated total cost of implementing the proposal for the two years is $7900. If the rate of no-show and appointment cancellation remains the same without any intervention, the clinic stands to lose $200,000 - $250,000.00 by the end of the year 2021. The estimated cost of providing these interventions is small compared to the potential loss in revenue to the clinic without such interventions.

***Development of the Process*:**

Stage 1: Presentation of my study results to the management – Formally present the result of the study based on the data from our EHR.

Stage 2: Present a proposal containing the intervention, timeframe for implementation, budget approval.

The anticipated date for the beginning of the intervention is January 2019, and the campaign will run till December 2021. At the end of the campaign, another review would be conducted to determine whether we've achieved our goal of reduction in a no-show and missed appointment to below 5% from the current 20.6%

Stage 3: Set up an implementation committee which will include the Clinic director, Office manager, and one Physical Therapist. The committee will plan for the roll-out of the process. The committee will also meet monthly and quarterly to review key performance indicators.

***Anticipated Barriers during implementation*:**

Language barrier: The majority of the patient population in our facility are visible minorities who have a first language other than English. Many of them do not understand English language at a conversational level, and we have to rely on interpreters. Our interventions have to factor this barrier into the intervention process. All our educational materials will be translated into other dominant languages

for ease of understanding. Our automated SMS messages will also be in the multi-lingual format in other to help this patient population.

Patient and provider attitudes: I anticipate some problems regarding particular patient's attitudes to some changes we will be making. Providers' attitudes towards no-shows and appointment cancellation ought to change as well. Through a sustained education, everyone can see the issues for what they are, economic and care outcome saboteur for the clinic.

Consistency of effort: We often fail to apply our rules consistently, overlooking certain people's wrongdoing. If the rules aren't applied consistently in every situation, we delegitimize the whole process. Staff training is an essential part of this.

Cost over-run: This is a scenario in which the actual cost of implementation exceeds the budgeted amount.

***Benchmark for success*:**

Month-to-month reduction in the no-show and cancellation rate of the clinic within the budgeted cost. Table 7 below shows that the total number of no-shows and appointment cancellations peaked in March and lowest in January, factors contributing to this month-to-month fluctuation are not known and not investigated in this study. Our interventions aim to bring down the monthly missed appointment to 3-5%.

Table 7: Monthly % of total missed appointments

Month	% of total missed appointments
January	5.8
February	9.5
March	10.7
April	8.1
May	10.6
June	8.6
July	7.5
August	7.7
September	6.3
October	10.6
November	6.9
December	7.6

Project strength and limitation:

This project's primary strength is the insight we gained about how much revenue we failed to generate due to no-shows and appointment cancellation. The stakeholders got the evidence to help them make informed decisions on why and how to combat this issue within our clinical setting. However, the study was not without its limitations, including our EHR's inability to aggregate and ranked the reasons for no-shows and cancellations. The database was analyzed manually to identify and ranked those reasons; this was time-consuming and less effective. The study did not consider the race, education level, socio-economic status, and other patient attributes that might have given us a deeper understanding of this clinical conundrum. Future research should look into the correlation between missed appointments and other factors such as race, education level, and patient's socio-economic status.

CONCLUSION

There is no doubt that, for the practice to remain in business, most especially during this economic slowdown, healthy cash flow is necessary. No-show and appointment cancellation is a constant threat to cash flow and must be tackled with evidence-based solutions. Furthermore, it's also evident that missed appointments negatively impact the outcome of care for patients. While these challenges posed by missed appointment is an ongoing threat, all hands must be on deck to adapt to this ever-changing reality. During the implementation process, our focus as a healthcare facility will be on the key performance indicators such as financial performance, patient satisfaction, employee engagement and satisfaction, a decline in the rate of no-shows and cancellations. Feedback from all stakeholders is an essential part of the process; this helps gauge whether the process moves in the right direction. Although we do not anticipate a zero level of missed appointments, the current 20.6% rate is not sustainable. Working to bring this rate to a reasonable level of below 5% would be our goal for the next twenty-four months. Achieving this goal will require diligent tracking of missed appointments and proactive measures to counter it before it happens.

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