



Original article

Demographics and rates of surgical arthroscopy and postoperative rehabilitative preferences of arthroscopists from the Arthroscopy Association of North America (AANA)



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ABSTRACT

Survey of 869 arthroscopists regarding joint-specific arthroscopic procedures and postoperative rehabilitative preferences revealed comparable support for use of supervised physical therapy (SPT) and home exercise programs (HEPs) but stronger preference for joint-specific HEP applications (wrist, knee). Among respondents utilizing HEPs, modality of delivery (verbal/handout/web-based) didn't differ by joint, yet only 2.9% utilized web-based HEPs. This is the first known study to identify postoperative rehabilitation preferences. With 1.77 million estimated arthroscopic procedures annually (mean: 325.4 procedures/respondent), this study highlights under-utilization of web-based HEPs. Reliable, web-based HEPs can improve post-arthroscopic outcomes for patients, arthroscopic surgeons, and rehabilitative specialists while being cost efficient.

1. Introduction

Surgical arthroscopy is a well-established treatment option for patients suffering from persistent joint pain and dysfunction. Compared to open-joint surgeries, arthroscopy is minimally-invasive and boasts greater overall patient outcomes with respect to symptom relief, duration of hospital stay, structural recovery, and long-term results.^{1,2} However, the number of joint-specific arthroscopic procedures performed annually is not well-documented in the literature.

A major component of patient satisfaction following such procedures is likely attributable to the functional improvements patients experience following post-surgical rehabilitation therapy. In a randomized controlled trial, Moffet et al.³ found that patients receiving physiotherapy treatment had a significant increase in knee extensor strength, nearly 26% more than the control group. However, some practitioners believe that there is little substantive evidence to confirm the use of rehabilitation protocols.⁴

Within the literature, there is no consensus as to whether well-planned home exercise programs (HEPs) can be just as effective as supervised physical therapy (SPT) in achieving functional postoperative

recovery of the joint. Recently, Austin et al.⁵ found that patients treated with HEPs after total hip arthroplasty (THA) experienced the same improvements in function and quality of life compared to patients undergoing SPT. Yet other studies have found that SPT can lead to significantly improved overall functioning of the affected joint following arthroscopy when compared to HEPs.^{6,7}

Given the conflicting evidence, this study seeks to compare the preferences and beliefs of arthroscopic surgeons in the utility and benefits of postoperative home exercise programs (HEPs) and supervised physical therapy (SPT). This study also aims to obtain a quantifiable estimate of the number of arthroscopic surgeries performed around the United States and abroad, and to analyze how its application varies by region.

2. Methods

The Arthroscopy Association of North America (AANA) is an international non-profit organization of orthopaedic surgeons committed to advancing the field of arthroscopic surgery. 7200 electronic, Google-based surveys consisting of questions pertaining to post-arthroscopic

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rehabilitation philosophies were distributed to AANA members and results were received from April 3, 2017 to May 21, 2017. These surveys collected surgeons' demographical information and postoperative rehabilitation therapy beliefs across all arthroscopic joint disciplines. Also collected was information regarding the number of surgeries performed by each individual surgeon, while in addition, questioning arthroscopists on their mode of conveyance for home exercise regimen recommendations. Surgeons were instructed to only complete survey questions related to surgeries of the specific joints they perform. This study was deemed exempt by the Institutional Review Board (IRB) due to the de-identified nature of the data.

2.1. Demographics

Of the 869 surgeons who completed the survey, the highest proportion (35%) were between the ages of 36 and 45 years, while only 7% reported an age < 35 years (29% 46–55 years; 29% > 55 years). The majority (46%) of respondents reported > 16 years in practice (18% 0–5 years, 19% 6–10 years, and 17% 11–15 years). The survey extended beyond surgeons practicing in the United States to those practicing internationally. Internet Protocol (IP) addresses and zip codes were obtained from the survey group to localize respondents' region of practice. For those who failed to provide zip codes, IP addresses were utilized to aid localization efforts. The majority of respondents were in a group practice with other orthopaedic surgeons.

2.2. Statistical analysis

Survey results were transferred to spreadsheets using Microsoft Excel 2010 software (Microsoft Corporation, Redmond, WA, USA) and analyzed. Responses were tallied and percentages were calculated for each of the following groups: arthroscopists who preferred post-arthroscopic SPT rehabilitation and those who preferred HEP rehabilitation. Joint-specific survey data were compared by involved joint: shoulder, elbow, wrist, hip, knee, and ankle. Surgeons who referred patients for HEPs were further questioned on the setting in which recommendations are given (office, PT facility, or other) and methodology of conveyance (web-based, verbally conveyed, or by handouts) of such regimens. Chi-square analysis was employed to identify any significant differences between respondents.

Nominal data was also gathered from this study, with intention to estimate the annual number of arthroscopic surgeries performed across the United States (US). Survey respondents could free-text the number of arthroscopies performed each year for each joint. Given the free-text feature, certain inputs (e.g. number ranges or responses including terms such as "more than" or "greater than") were adjusted prior to analysis. For example, nominal data that included phrases such as "more than" etc., the number value provided was used for analysis (e.g. if more than 200, 200 was used). The means and standard deviations were also calculated for ranged nominal data (e.g. 50–100, we used 75). Sums were calculated and data was geographically regionalized by utilizing the official Census Division and Regions Map of the United States provided by the United States Census Bureau.⁸ These sums were then extrapolated, assuming similar distribution patterns obtained in the study and full compliance from survey respondents. The mean number

of arthroscopies performed was determined and regionally separated; significant differences were determined by employing analysis of variance (ANOVA).

Statistical analyses were performed using Microsoft Excel and SPSS software version 23.0 2017 (IBM Corporation, Armonk, NY, USA). All p-values were two-tailed; $p < 0.05$ was established as the threshold for statistical significance. All tables were generated using Microsoft Word 2010 (Microsoft Corporation, Redmond, WA, USA).

3. Results

3.1. Supervised physical therapy and home exercise programs

Our survey found that comparable proportions of respondents believed in the utilization of post-arthroscopic SPT and HEP (SPT: 91.5% of 869 surgeons vs. HEP: 94.4% of 858 surgeons; $p = 0.063$). When comparing these preferences among arthroscopists by joint-specific practices, a significant difference was identified between SPT and HEP utilization among wrist (SPT: 71.88% [n = 32] vs. HEP: 96.55% [n = 29]; $p = 0.009$) and knee (SPT: 88.47% [n = 92] vs. HEP: 95.53% [n = 92]; $p = 0.0017$) specialists. No such differences were found between shoulder ($p = 0.238$), elbow ($p = 0.221$), hip ($p = 0.094$), or ankle ($p = 0.467$) specialists. There was a significant difference in the belief in utilizing supervised physical therapy when comparing each of the joint surgeries ($p < 0.001$). However, this was not the case when comparing the surgeries by joint with respect to belief in HEP utility ($p = 0.182$) (Table 1).

When evaluating HEPs specifically, the survey identified that different strategies were employed when offering post-arthroscopic HEP instruction to patients. Half of the respondents in the survey provided instructions directly from their office; the majority of the other half of respondents had physical therapists offer instruction. Surgeons also conveyed rehabilitation instructions in variety of ways, with the 61.4% of respondents providing instructions by means of handouts and 31.9% offering instructions verbally. Only 2.9% indicated that they utilized a website for this purpose. No significant difference was identified with respect to selected mode of conveying instructions when comparing each joint surgery group ($p = 0.058$) (Table 2).

3.2. Arthroscopy by geographic distribution

The annual number of arthroscopic procedures in the US was predicted to be 1.77 million. Survey responses were received from 244 US-based orthopaedic surgeons who reported performing an estimated total of 79,395 arthroscopies annually (mean = 325.4). Responses were subsequently separated by regional reporting, and surgeons from the South (n = 102) were found to have performed the highest number of surgeries (mean = 354.3, SD = 392.9). However, no significant differences were found when comparing the number of procedures performed by region ($p = 0.472$) (Table 3).

4. Discussion

While postoperative rehabilitation programs have proven to be a valuable component to the recovery process, there is no clear-cut

Table 1

Surgeon-reported preferences and trust in post-arthroscopic rehabilitation, stratified by joint-specific and overall arthroscopy.

Post-Arthroscopic Rehabilitation Beliefs	Shoulder	Elbow	Wrist	Hip	Knee	Ankle	Total	P-value
Physical Therapy (n)	96.21% (290)	88.78% (98)	71.88% (32)	98.39% (62)	88.47% (295)	91.3% (92)	91.5% (869)	< 0.0001
Home Exercise Programs (n)	94.1% (288)	93.75% (96)	96.55% (29)	91.94% (62)	95.53% (291)	88.04% (92)	94.4% (858)	0.182
P-value (PT vs. HEP)	0.238	0.221	0.009	0.094	0.002	0.467	0.063	

The values in bold indicate statistical significance ($p < 0.05$).

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