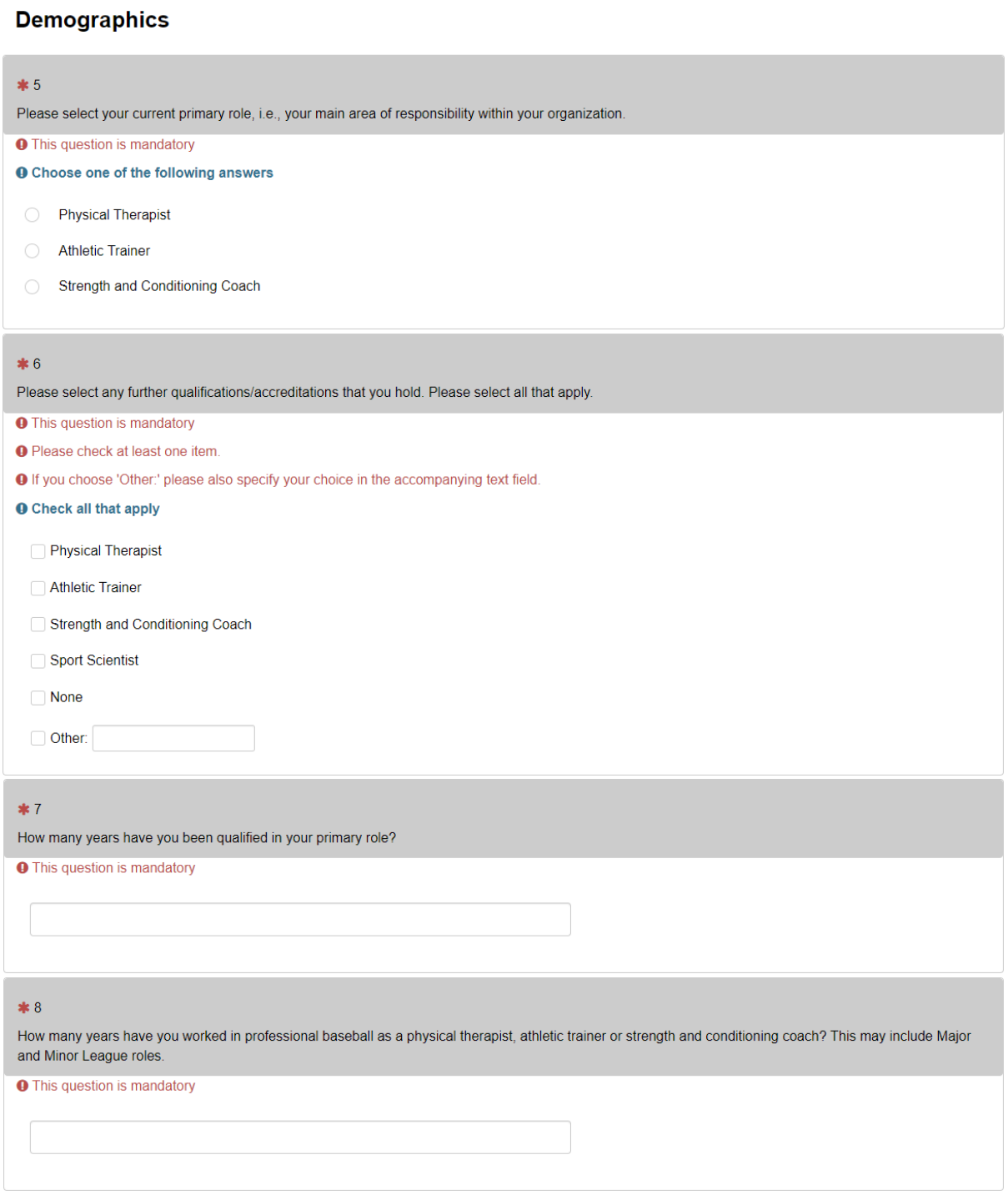
Supplemental Figure 1. Survey structure. The survey content began with question 5.



Demographics

✱ 5

Please select your current primary role, i.e., your main area of responsibility within your organization.

This question is mandatory

Choose one of the following answers

- ○ Physical Therapist
- ○ Athletic Trainer
- ○ Strength and Conditioning Coach

✱ 6

Please select any further qualifications/accreditations that you hold. Please select all that apply.

This question is mandatory

Please check at least one item.

If you choose 'Other:' please also specify your choice in the accompanying text field.

Check all that apply

- ☐ Physical Therapist
- ☐ Athletic Trainer
- ☐ Strength and Conditioning Coach
- ☐ Sport Scientist
- ☐ None
- ☐ Other:

✱ 7

How many years have you been qualified in your primary role?

This question is mandatory

✱ 8

How many years have you worked in professional baseball as a physical therapist, athletic trainer or strength and conditioning coach? This may include Major and Minor League roles.

This question is mandatory

9

Have you worked at an elite/professional level in any other sports? If so, please specify which sport(s) and the number of years.

✱ 10

Please specify which team you work with. Note that this information will only be used to specify how many teams responded, not which teams responded. I.e., "At least one member of staff from xx of 30 MLB teams responded." Only the main researchers will have access to this information and your responses will never be shared with your organization.

This question is mandatory

✱ 11

Q9. Please specify your gender.

This question is mandatory

Risk Factors and Identification

12 Please answer the following questions based on your beliefs and practices within your current MLB role and organization.

✱ 13

Do you test/screen your athletes for hamstring strain injury risk factors?

Choose one of the following answers

- Yes, during Spring Training
- Yes, during Spring Training and in-season
- Yes, during Spring Training, in-season, and off-season
- No

✱ 14

If yes, did you provide specific training recommendations/modifications to coaching staff for those players you considered to be at higher risk of hamstring strain injuries?

Yes No

✱ 15

Please specify your perceived importance of the following as intrinsic risk factors for hamstring strain injury in your players. Please answer for primary (first-time) injuries and secondary (recurrent) injuries on each scale. (If an answer is not applicable, select 'Not Sure'.)

	Primary HSI					Secondary HSI				
	Very Important	Important	Somewhat Important	Not Important	Not Sure	Very Important	Important	Somewhat Important	Not Important	Not Sure
Previous hamstring injury	○	○	○	○	○	○	○	○	○	○
Previous lower limb injury (non-hamstring)	○	○	○	○	○	○	○	○	○	○
Age	○	○	○	○	○	○	○	○	○	○
Playing position	○	○	○	○	○	○	○	○	○	○
Maximal muscle strength	○	○	○	○	○	○	○	○	○	○
Strength endurance (i.e., resistance to fatigue)	○	○	○	○	○	○	○	○	○	○
Between-limb muscle imbalance (i.e., side-to-side difference)	○	○	○	○	○	○	○	○	○	○
Within-limb muscle imbalance (i.e., agonist:antagonist in the same side)	○	○	○	○	○	○	○	○	○	○
Internal hamstring muscle architecture (e.g., fascicle length)	○	○	○	○	○	○	○	○	○	○
Gross muscle geometry (e.g., muscle volume or cross-sectional area)	○	○	○	○	○	○	○	○	○	○
Hamstring tendon properties (e.g., stiffness)	○	○	○	○	○	○	○	○	○	○
Tolerance to high-speed running/sprinting	○	○	○	○	○	○	○	○	○	○
Acute fatigue (e.g., following intense actions in an individual inning)	○	○	○	○	○	○	○	○	○	○
Accumulated fatigue (i.e., towards end of a game)	○	○	○	○	○	○	○	○	○	○
Accumulated fatigue (i.e., through a season)	○	○	○	○	○	○	○	○	○	○
Overall physical fitness	○	○	○	○	○	○	○	○	○	○
Balance/coordination	○	○	○	○	○	○	○	○	○	○
Joint mobility (trunk)	○	○	○	○	○	○	○	○	○	○
Joint mobility (lower limb)	○	○	○	○	○	○	○	○	○	○
Flexibility	○	○	○	○	○	○	○	○	○	○
Movement efficiency	○	○	○	○	○	○	○	○	○	○
Sleep	○	○	○	○	○	○	○	○	○	○
Wellness (e.g., mood, fatigue, muscle soreness)	○	○	○	○	○	○	○	○	○	○
Biochemical markers (e.g., blood, saliva)	○	○	○	○	○	○	○	○	○	○
Hydration	○	○	○	○	○	○	○	○	○	○

16 Are there any other intrinsic risk factors for hamstring strain injuries that you consider important with your players? If so, please specify them below with your perceived level of importance.

✱ 17

Please specify your perceived importance of the following as extrinsic risk factors for hamstring strain injury in your players. Please answer for primary (first-time) injuries and secondary (recurrent) injuries on each scale.

	Primary HSI					Secondary HSI				
	Very Important	Important	Somewhat Important	Not Important	Not Sure	Very Important	Important	Somewhat Important	Not Important	Not Sure
Congested game schedule	○	○	○	○	○	○	○	○	○	○
Reduced recovery time between games	○	○	○	○	○	○	○	○	○	○
Number of games/innings played during the season	○	○	○	○	○	○	○	○	○	○
Training load	○	○	○	○	○	○	○	○	○	○
Training type	○	○	○	○	○	○	○	○	○	○
Footwear	○	○	○	○	○	○	○	○	○	○
Poor field quality	○	○	○	○	○	○	○	○	○	○
Change to playing on artificial turf from natural grass	○	○	○	○	○	○	○	○	○	○
Change in natural grass type	○	○	○	○	○	○	○	○	○	○
Climate	○	○	○	○	○	○	○	○	○	○
Frequent travel	○	○	○	○	○	○	○	○	○	○
Training facilities available	○	○	○	○	○	○	○	○	○	○
Recovery facilities available	○	○	○	○	○	○	○	○	○	○
Importance of games (e.g., World Series or late season qualifying games)	○	○	○	○	○	○	○	○	○	○
Internal communication (i.e., between staff)	○	○	○	○	○	○	○	○	○	○
Key staff changes (i.e., consistency of same staff group)	○	○	○	○	○	○	○	○	○	○
Non-sport related stress (e.g., personal issues, non-baseball daily activities etc.)	○	○	○	○	○	○	○	○	○	○

18 Are there any other extrinsic risk factors for hamstring strain injuries that you consider important with your players? If so, please specify them below with your perceived level of importance.

Risk Management Strategies

19 Please answer the following questions based on your beliefs and practices within your current MLB role and organization.

* 20

Are you responsible (either wholly or partly) for the design or implementation of injury prevention strategies for players?

Yes No

* 21

Who do you discuss preventative strategy content with? Please select all that apply.

Check all that apply

- [ ] Practitioners within your organization
- [ ] Practitioners within baseball but not at your organization
- [ ] Practitioners not working in baseball
- [ ] Players within your organization
- [ ] Players outside your organization
- [ ] Researchers in similar fields
- [ ] Other. Please specify.

* 22

Who makes the final decision on content of injury prevention protocols within your organization (please provide job title(s) rather than names)?

* 23

How do you access information to keep up to date with current practices in hamstring injury prevention? Please select all that apply.

Check all that apply

- [ ] Baseball-specific conferences, e.g., Winter Meetings
- [ ] Non-baseball conferences
- [ ] Short courses/seminars/webinars
- [ ] Journal articles
- [ ] Blog posts
- [ ] Social media posts
- [ ] Peer-to-peer feedback, shadowing or mentoring
- [ ] Other:

✱ 24

Rate the effectiveness of each of the strategies/training methods with regard to mitigating the risk of hamstring strain injuries based on your perception of it in your current role.

	Very effective	Effective	Neither effective nor ineffective	Ineffective	Very ineffective
Eccentric-only training exercises (e.g., Nordics, hip extension etc.)	○	○	○	○	○
Isometric-only training exercises (Supine holds, Roman chair etc.)	○	○	○	○	○
Traditional resistance training exercises (RDLs, Squats etc.)	○	○	○	○	○
Regular exposure to high-speed running/sprinting	○	○	○	○	○
Plyometrics	○	○	○	○	○
Flexibility/mobility training	○	○	○	○	○
Foam rolling	○	○	○	○	○
Neural flossing	○	○	○	○	○
Core/Lumbopelvic strengthening	○	○	○	○	○
Improving running mechanics	○	○	○	○	○
Periodization (well planned, progressively overloaded programming with appropriate deload and recovery time)	○	○	○	○	○
Massage/Soft tissue therapy	○	○	○	○	○
Joint mobilizations	○	○	○	○	○
Muscle stimulation, e.g., compex	○	○	○	○	○
Laser therapy	○	○	○	○	○
Blood flow restriction training	○	○	○	○	○
Managing overall workload	○	○	○	○	○
Managing hydration	○	○	○	○	○

25 Are there any other strategies/training methods for hamstring strain injuries that you are aware of? If so, please specify them below with your perceived level of effectiveness.

✱ 26

Q18. Please specify which of the following you are currently implementing with your players.

Choose one of the following answers

- ○ Team injury prevention exercise program only
- ○ Individual injury prevention exercise program only
- ○ Both team and individual exercise program
- ○ No injury prevention exercise program

✱ 27

Which training strategies are you actively employing with your club/team/organization to mitigate the risk of hamstring strain injuries? Please select all that apply.

Check all that apply

- [ ] Eccentric-only training exercises (e.g., Nordics, hip extension etc.)
- [ ] Isometric-only training exercises (Supine holds, Roman chair etc.)
- [ ] Traditional resistance training exercises (RDLs, Squats etc.)
- [ ] Flexibility
- [ ] Core/Lumbopelvic strengthening
- [ ] Regular exposure to high-speed running/sprinting
- [ ] Improving running mechanics
- [ ] Periodization (well planned, progressively overloaded programming with appropriate de-load and recovery time)
- [ ] Managing overall workload
- [ ] Managing hydration
- [ ] Other:

✱ 28

What are your three most frequently used eccentric-only exercises for hamstring strain injury prevention?

✱ 29

What are your three most frequently used isometric-only exercises for hamstring strain injury prevention?

✱ 30

What are your three most frequently used traditional resistance training exercises for hamstring strain injury prevention?

✱ 31

Please briefly describe the areas of the body (i.e., regions or specific muscle groups etc.) targeted during flexibility training for hamstring strain injury prevention.

✱ 32

What are your three most frequently used core/lumbopelvic strengthening exercises for hamstring strain injury prevention?

✱ 33

Do you measure maximum running speed for your players for the purpose of hamstring strain injury prevention?

Choose one of the following answers

- Yes, during Spring Training
- Yes, during Spring Training and in-season
- Yes, during Spring Training, in-season, and off-season
- No

✱ 34

How do you measure maximum running speed?

Choose one of the following answers

- GPS-derived values
- Radar gun
- Speed/light gates
- In-stadia computerized tracking
- Other:

✱ 35

Do you monitor high-speed running exposures as part of hamstring strain injury prevention programs?

Choose one of the following answers

- Yes, during Spring Training
- Yes, during Spring Training and in-season
- Yes, during Spring Training, in-season, and off-season
- No

✱ 36

As a percentage of a player's maximal velocity, what do you consider to be 'high-speed running?'

✱ 37

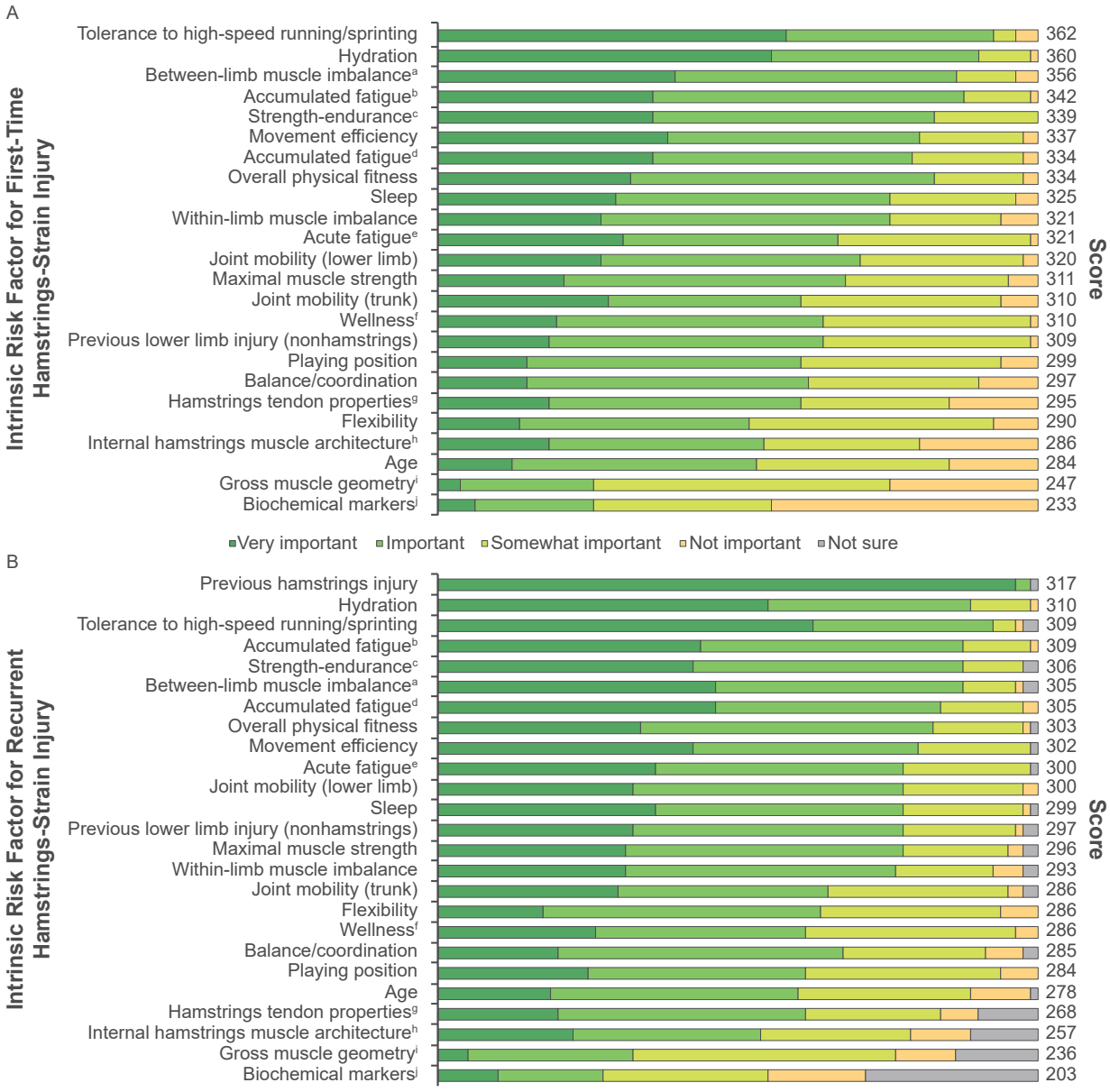
Do you believe there are any barriers/limitations to implementing effective hamstring strain injury prevention programs within your organization?

Yes | No

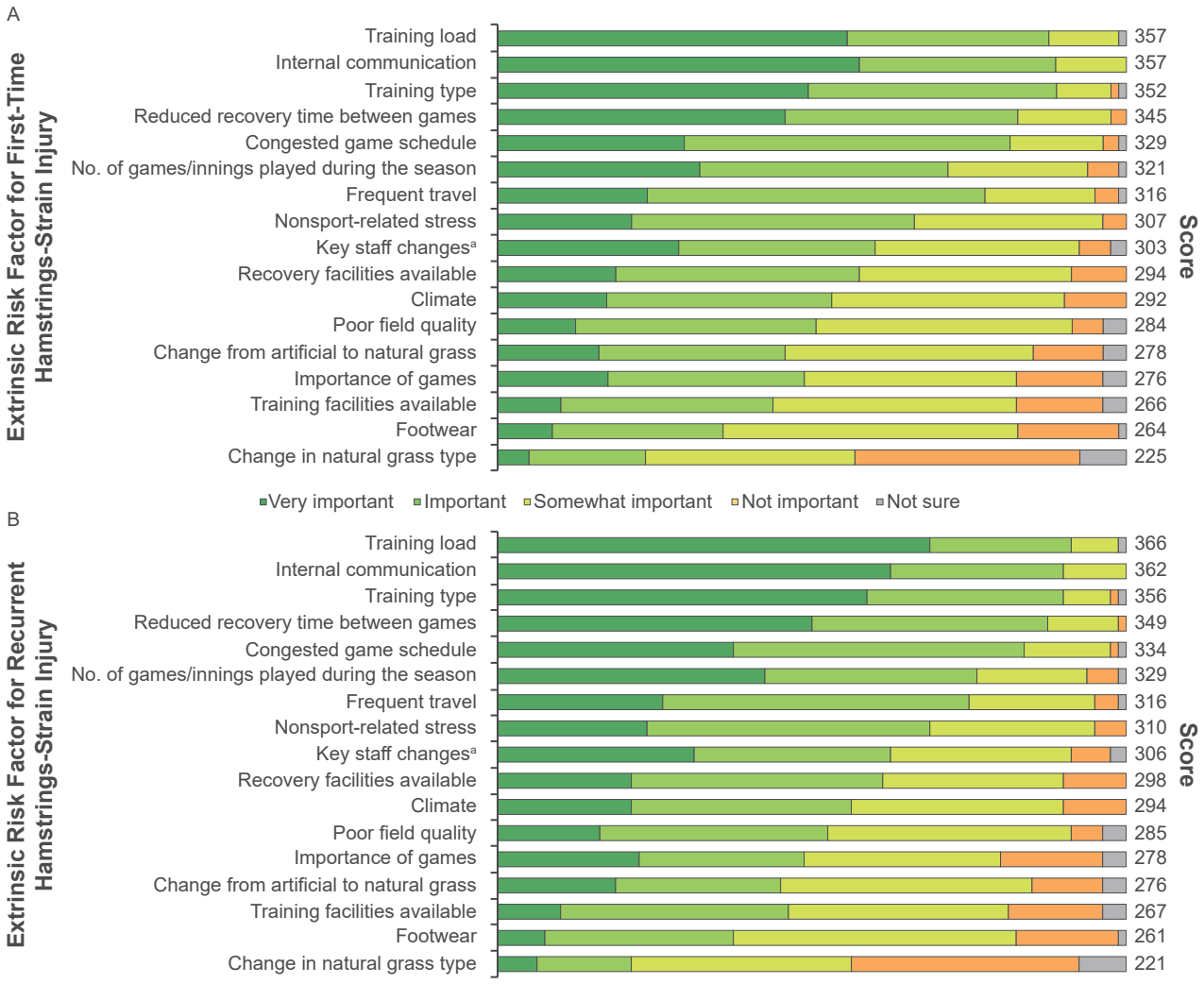
✱ 38

Please specify the perceived barriers/limitations to implementing effective hamstring strain injury prevention programs within your organization.

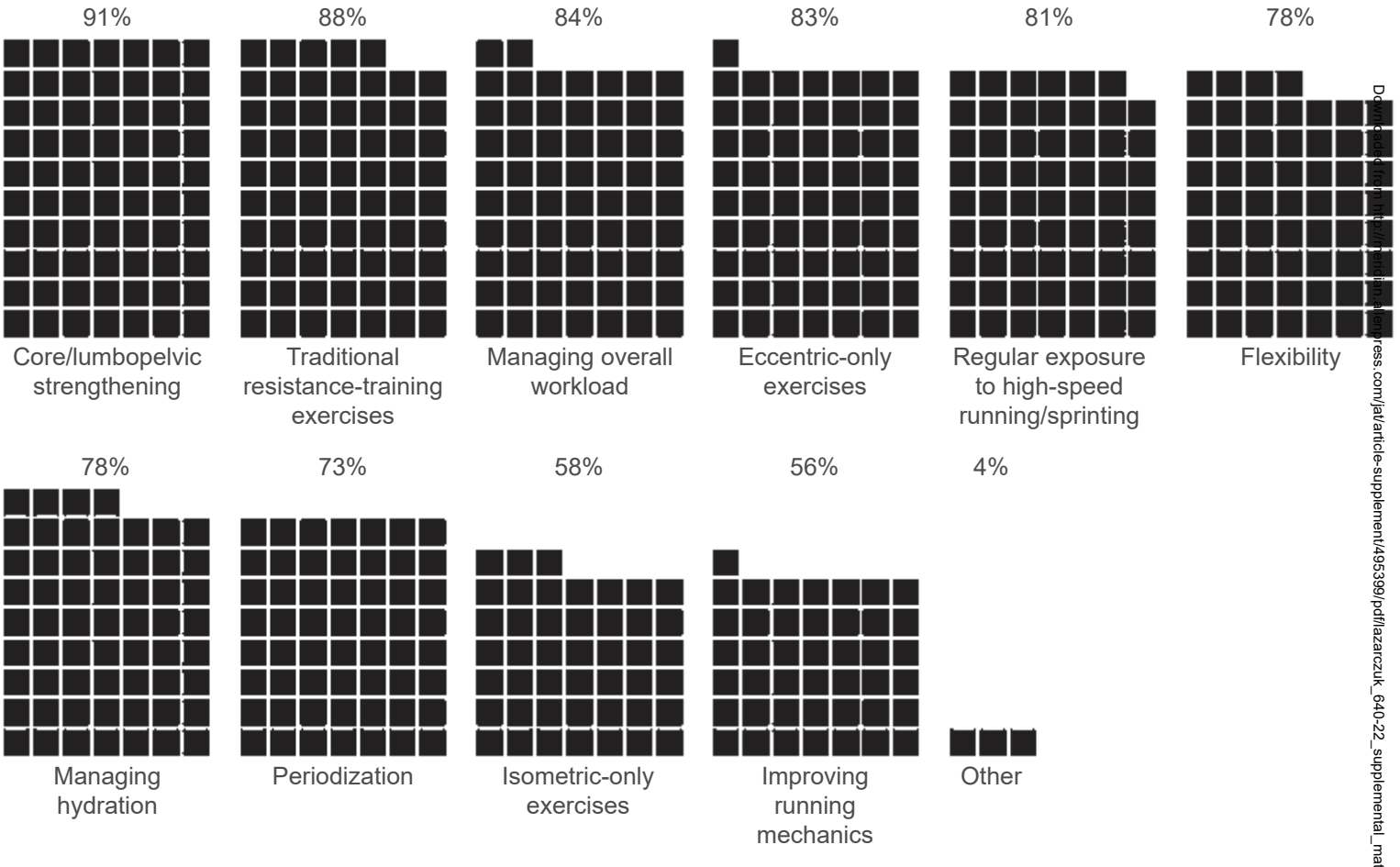
Supplemental Figure 2. Intrinsic risk factors for A, first-time and B, recurrent hamstring strain injury ranked from perceived most important (top) to least important (bottom), with the proportion of responses per importance category (ie, very important, important) and total ranking score. [a] Side-to-side difference. [b] Through a season. [c] Resistance to fatigue. [d] Toward the end of a game. [e] For example, in an individual inning. [f] For example, mood, fatigue, and muscle soreness. [g] For example, stiffness. [h] For example, fascicle length. [i] For example, muscle volume or cross-sectional area. [j] For example, blood and saliva.



Supplemental Figure 3. Extrinsic risk factors for A, first-time and B, recurrent hamstring strain injury ranked from perceived most important (top) to least important (bottom), with the proportion of responses per importance category (ie, very important, important) and total ranking score. [a] Consistency of staff group.



Supplemental Figure 4. Hamstring strain injury prevention strategies ordered from most to least frequently used. Percentages represent the proportion of respondents who reported using each strategy.



Supplemental Table 1. Most Commonly Programmed Exercises or Areas of Focus for Prevention Strategies[a]

Training Strategy[b]									
Eccentric	**No.**	**Isometric**	**No.**	**Traditional**	**No.**	**Flexibility or Mobility**	**No.**	**Trunk or Lumbopelvic**	**No.**
Nordic	57	Bridge	24	RDL	54	Hip flexors	27	Dead bug	30
RDL	25	Manuals	14	Squats	20	Hamstrings	25	Plank	24
Hamstring curls	22	Glute ham raise	9	Deadlift	19	Hips	25	Bridge	21
Manuals	19	Hamstring curl	7	Hamstring curl	15	Quadriceps	17	Bird dog	11
Hip extension	10	Nordic	7	Bridge	11	Lumbar	16	Bears	7
Sliders	9	PRI	3	Lunge	8	Gluteals	14	PRI	7
Bridge	3	Progressive relaxation techniques	3	Nordic	6	Ankle	11	Pallof press	6
Glider	3	RDL	3	Hip thrust	5	Adductor	9	DNS	5
NordBord[c]	3	Balance	1	Manuals	5	Calf	9	Woodchops	4
Razor curl	3	Heel dig	1	Sliders	5	Thoracic	6	Anti-rotation	3
Flywheel	2	Hip extension	1	Glute ham raise	4	IT band or TFL	5	Medicine balls	3
K box	2	Leg plank	1	RFESS	3	Posterior chain	4	Pelvic tilts	3
Box jumps	1	NordBord[c]	1	Bands	2	Anterior chain	3	Hamstring curl	3
Copenhagen	1	Prone claw	1	Fly wheel	2	Pelvis	3	Aqua bag	2
Deadlift	1	Rack pulls	1	Split squat	2	Trunk	3	Cat cow	2
Depth/drop jumps	1	Roman chair	1	Balance	1	Feet	2	Copenhagen	2
Diver	1	Squats	1	Bears	1	Lower limb	2	Crunches	2
Glute ham raise	1	Superman	1	Depth/drop jumps	1	Ribs	2	Diaphragmatic breathing	2
Hinge	1			Hinge	1	Thigh	2	Pilates	2
Hyperextensions	1			High-speed running	1	Knee	1	PNF	2
Keiser[d] resisted walk	1			Hydrotherapy	1	Latissimus dorsi	1	RDL	2
Kneeling slide board knee extension	1			Jammer snatch	1	Lower leg	1	Rollouts	2

PNF	1			KB swing	1	QL	1	Antiextension	1
SL pawing	1			NordBord[c]	1	Shoulder	1	Bands	1
Squats	1			Pawing	1			Cable lift	1
				Pistol squat	1			Farmer walks	1
				Plyometric	1			Fire hydrant	1
				Pull through	1			Hip extension	1
				Rack pulls	1			Hip manuals	1
				Resisted sprint	1			Hydrotherapy	1
				Step up	1			Leg raises	1
								Nordic	1
								Pull through	1
								Rotational throw	1
								TrA	1
								Trunk rotation	1
								Yoga	1

Abbreviations: Copenhagen, Copenhagen adductor exercise; DNS, dynamic neuromuscular stabilization exercises; IT, iliotibial; KB, kettlebell; Nordic, Nordic hamstring exercise; PNF, proprioceptive neuromuscular facilitation; PRI, Postural Restoration Institute exercises; QL, quadratus lumborum; RDL, Romanian deadlift; RFESS, rear foot elevated split squat; SL, single leg; TFL, tensor fascia lata; TrA, transversus abdominis exercises.

[a] Practitioners were asked to specify their 3 most frequently used exercises for each of the strategies chosen in an earlier question. Not all practitioners provided information on the same number of exercises per strategy, and 1 practitioner did not provide an answer. Exercises are grouped by generic names, regardless of equipment or programming choices. When equipment was specified independently of specific exercises performed using it or them, these pieces of equipment have been listed. For flexibility exercises, the soft tissues targeted have been specified; for mobility, the joint or region has been specified. If the information provided was vague (eg, the exercise was not known to the research team under that name), the information provided reflects the exact terminology provided by the practitioners.

[b] Terminology reflects the descriptors provided by respondents.

[c] Vald Performance.

[d] Keiser cable machine; Keiser Corporation.

Supplemental Table 2. Barriers to Effective Implementation of Hamstring Strain Injury Prevention Strategies

Theme and Subtheme	Responses, No. (%)[a]	Raw Data Representing This Response[b]
Buy-in	17 (28)	
Players	9 (12)	"Players' hesitancy to do the training and trust that it is truly what they need."
Staff	11 (14)	"Push back from on-field coaching staff, lack of buy-in from players and coaching staff."
Compliance	13 (22)	
Players	8 (13)	"Probably the single biggest contributing factor for all the spring training and even early season injury rates increasing because these guys never really 'turn it on' until they have to when the games count for fear of getting hurt in training and then not being able to participate or not make the team."
Staff	1 (2)	"Staff compliance."
Workload	11 (18)	
Management	8 (13)	"Resistance to workload principle as to decreasing baseball specific work versus sprint work."
Training construction	3 (5)	"Agreement with practice/training construction (especially in season)."
Schedule	9 (15)	"The fact that we play games every day. Training and periodization are difficult because players need to be ready every day, maximizing recovery is difficult. Techniques that we feel would work may not be possible."
Staffing	5 (8)	"Limited number of staff to implement [programs]."
Other	5 (8)	
External influence	2 (3)	"Outside/external influences."
Physical qualities	2 (3)	"Players lack the baseline strength and make-up to complete eccentric strengthening exercises during the season."
Technology	1 (2)	"Technology to evaluate the specific muscle structure."

[a] The number of respondents who listed the key theme is presented for each theme. The number of times a subtheme was mentioned may not sum to equal the number for the overall theme. For example, 17 respondents provided information relating to buy-in, of whom 9 listed player involvement and 11 listed staff involvement. Percentages are reported as the proportion of the total number of responses.

[b] Each quotation is from a different respondent.