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Prevalence of Hip Flexor Tightness in Young Adults

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Abstract

Introduction: Hip Flexor Tightness Is A Common Musculoskeletal Concern That Can Impact The Functional Abilities And Overall Well-Being Of Individuals. Despite Its Potential Significance, Limited Research Has Focused On The Prevalence Of Hip Flexor Tightness In The Young Adult Population. This Study Aims To Investigate The Prevalence Of Hip Flexor Tightness Among Young Adults And Explore Potential Contributing Factors.

Objectives: The Primary Objective Of This Cross-Sectional Study Is To Determine The Prevalence Of Hip Flexor Tightness In A Sample Of Young Adults Aged [18-25]. Secondary Objectives Include Identifying Potential Risk Factors Associated With Hip Flexor Tightness And Discussing Its Implications For Daily Activities And Quality Of Life.

Results: A Representative Sample Of 385 Young Adults Participated In The Study. Hip Flexor Flexibility Was Assessed Using Standardized Measurements By Modified Thomas Test, And Participants Provided Information On Their Sedentary Behaviour, Physical Activity Levels, And Postural Habits Through Self-Report Questionnaires (GPAQ). The Results Indicate A Significant Prevalence Of Hip Flexor Tightness In The Studied Population, With 94.3% Of Participants Exhibiting Hip Flexor Tightness. Sedentary Behaviour And Decreased Physical Activity Were Identified As Potential Contributing Factors To The Observed Prevalence.

Discussion: The Findings Of This Study Underscore The Importance Of Addressing Hip Flexor Tightness In Young Adults, As It Can Potentially Lead To Discomfort, Compromised Movement Patterns, And Diminished Quality Of Life. Sedentary Behaviour And Reduced Physical Activity Levels Emerged As Modifiable Risk Factors, Emphasizing The Need For Interventions That Promote Regular Physical Activity And Ergonomic Practices. The Implications Of Hip Flexor Tightness On Functional Activities And Musculoskeletal Health Warrant Further Investigation, Particularly Through Longitudinal Studies.

Conclusion: This Study Provides Valuable Insights Into The Prevalence Of Hip Flexor Tightness Among Young Adults. The Findings Highlight The Significance Of Early Detection And Proactive Measures To Prevent Or Mitigate Hip Flexor Tightness. Addressing Sedentary Behaviour And Promoting Physical Activity Are Crucial Steps In Reducing The Prevalence Of Hip Flexor Tightness And Enhancing Overall Musculoskeletal Health In This Demographic. Further Research Is Recommended To Delve Deeper Into The Causative Factors And Long-Term Consequences Of Hip Flexor Tightness.

Keywords: Hip Flexor, Modified Thomas Test, Iliopsoas Tightness, Prevalence, Sedentary Lifestyle, Physical Activity, Prolonged Sitting.

Introduction

Hip Flexor Tightness Has Become Increasingly Prevalent In Modern Society Especially In Young Adults (Ages Approximately 18 To 26 - Is A Critical Period Of Development With Long-Lasting Implications) [1,2]. Previously, Physical Activity Was A Fundamental Part Of Daily Life And People Were More Engaged In Manual Work. Today, Physical Activity Has Become More Optional And Structured [1]. Nowadays, People Are More Engaged In Sedentary Activities Such As Increased Screen Time Due To Work From Home Concept And Decreased Overall Movement [1,3,4]. This Aetiology Can Affect The Various Body Systems Such As The Musculoskeletal, Cardiovascular, Metabolic, Respiratory, Psychological And Emotional Well-Being. The Sedentary Work Nature Has Been The Root Cause For A Variety Of Musculoskeletal Disorders And Discomforts Which Are Broadly Classified Under The Umbrella Of Work-Related Musculoskeletal Disorders (WRMSD) [5]. Changes In Lifestyle Can Have A Significant Impact On Muscle Health. Muscles Are Essential For Overall Health And Functionality, And A Variety Of Lifestyle Factors Can Influence Their Strength, Mass, And Overall Well-Being [6]. More Often, Sedentary Behaviour Associated With Musculoskeletal Health And Function By Altering The Muscle Properties [6,21]. Reduced Physical Activity Results In Shortening Of Length Of The Muscle Fibres And Gradually Leads To Its Tightness And Weakness.

One Area Of Interest In This Context Is The Prevalence Of Hip Flexor Tightness In Young Adults Who Lead A Sedentary Lifestyle. Hip Flexor Tightness Is Closely Related To An Inactive Lifestyle. We Tend To Spend A Lot Of Time Sitting, Which Keeps The Hip Flexors In A Shortened Position For Extended Periods Of Time [1,3,4]. This Constant Flexed Posture Causes The Hip Flexors To Adapt And Shorten Or Tighten. Short Muscles Do Not Generate As Much Force As Long Muscles. When You Try To Activate These Muscles, They May Resist Or Not Work As They Should [5,7]. The Hip Flexors Are A Group Of Muscles At The Front Of The Hip Joint That Are Responsible For Flexing The Hip And Lifting The Thigh Toward The Abdomen. The Iliacus Muscle, The Great Psoas Muscle (Also Called The Iliopsoas Muscle), The Main Players (Agonists) For Hip Flexion, And The Thigh Muscle (Rectus Femoris), Which Is Part Of The Quadriceps And Has Two Functions: Flexion Of The Hip And Extension Of The Knee. They Play A Crucial Role In Various Daily Activities And Are Responsible For Facilitating Movements Such As Walking, Running, And Maintaining Proper Posture [8].

The Hip Flexors Work In Coordination With Other Muscles Such As The Glutes, Hamstrings, And Abdominals To Perform The Required Movements. When Walking, The Hip Flexors Initiate The Swing Phase Of The Leg By Flexing The Hip To Allow Forward Momentum [8]. It Connects The Lumbar Spine To The Lower Body And Helps Stabilize The Pelvis And Spine During Dynamic Movements [9]. They Also Play A Role In Maintaining Balance And Stability During Various Functional Activities Such As Walking, Running, Stair Climbing And Pedalling. In Particular, The Psoas Major Is An Important Muscle For Trunk Stability [10,11].

The Extension Of The Iliopsoas, Which Extends From The Thoracolumbar Region Through The Lumbar Spine And Pelvis To The Base Of The Thigh, Contributes To Spinal Stability And Serves As An Important Compressor Of The Lumbar Spine [12]. Although It Can Only Generate Small Moments In The Sagittal Plane, Iliopsoas Activity Is Necessary For Spinal Stability [13]. However, Excessive Compression, Which Can Be Caused By A Tight Iliopsoas Muscle, Can Negatively Impact Spinal Health [13]. Tight Hip Flexor

Muscles Were Defined By Kendall Et Al. As The Inability To Fully Extend The Hip In The Modified Thomas Test Position. In Addition, Many Patients With Low Back Pain Lose The Ability To Extend Their Hip Due To Tight Hip Flexors. According To A Study By Licciardone Et Al. Elimination Of Psoas Syndrome May Be An Important And Previously Overlooked Mechanism Underlying Clinical Improvement In Patients With Chronic Low Back Pain [13,14]. Imbalance Or Tightness In The Hip Flexors Can Affect Posture And Lead To Problems Such As Anterior Pelvic Tilt. Tense Hip Flexors Can Pull The Pelvis Forward And Cause Excessive Arching Of The Lower Back. This Altered Posture Can Contribute To Lower Back Pain And Discomfort By Placing Additional Stress On The Lumbar Spine [13]. In Addition, Sitting For Long Periods Of Time With Poor Posture Can Contribute To Postural Problems. Sitting Bent Forward Can Lead To Rounded Shoulders, Forward Head Posture, And Excessive Curvature Of The Lower Back. These Posture Problems Can Strain The Spine And Increase The Risk Of Musculoskeletal Pain.

There Are Studies That Compare The Iliopsoas Muscle Tightness In Students With High BMI And Those With Normal BMI Who Sit For Long Periods Of Time For Online Classes During The COVID-19 Pandemic, And They Conclude That Iliopsoas Muscle Tightness Was Present In Both Normal And Higher BMI On Both The Right And Left Sides. However, People With A Greater BMI (Overweight) Had More Iliopsoas Muscle Stiffness Than Students With A Normal BMI [15]. It Has The Potential To Have A Substantial Impact On Musculoskeletal Conditions. There Are Not Any Studies That Reveal The Prevalence Of Hip Flexor Tightness In Young Adults.

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The Thomas Test (TT), Named After Dr. Hugh Owen Thomas, Was Developed To Rule Out Hip Flexion Contracture (Thomas, 1878), So A Positive TT Indicates Hip Flexion Contracture. It Has Since Become Widely Used To Assess Hip Extensibility. The TT Is A Pass/Fail Test That Requires The Patient To Lie Supine On An Examination Table With Both Legs Straight Out In Front Of Them On The Table Top. While Supine, The Patient Flexes One Leg's Hip While Keeping The Knee Of The Same Leg Maximally Flexed At The Chest. Throughout, The Pelvis Is Kept Neutral. The Contralateral Leg Is Allowed To Be Relaxed And Flat Against The Tabletop. A Positive TT, Which Indicates Hip Flexion Contracture, Is Defined As Noticeable Hip Flexion Of The Contralateral Leg, As Indicated By A Gap Between This Leg And The Table Top [18].

Aim Of The Study

The Aim Of The Study Is To Find Out The Frequency Of Hip Flexor Tightness In Young Adults.

The Objective Of This Study

- To Assess The Hip Flexor Tightness Using Modified Thomas Test
- To Find The Prevalence Rate Of Hip Flexor Tightness In Young Adults.

Need Of The Study

There Are Various Studies That Show Evidence Of Hip Flexor Tightness In Young Adults Who Have A Sedentary Lifestyle, But There Are No Such Articles That Reveal The Prevalence Of Hip Flexor Tightness In Young Adults. Studying The Prevalence Of Hip Flexor Tightness In Young Adults Can Provide Insights Into The Potential Impact Of Sedentary Lifestyles, Postural Habits, And Other Factors On Musculoskeletal Health.

Materials And Methods

The Cross-Sectional Study Was Conducted In Various Geographical Representations Of Mangalore, Karnataka, From June To August 2023. Young Adults Aged Between 18 And 25 Who Were Eligible According To The Inclusion And Exclusion Criteria Were The Study Participants. The Inclusion Criteria Were That The Participant Should Be Between 18 And 25 Years Of Age, Both Male And Female. The Participants Who Were Having Any Neurological Conditions That Alter The Resting Muscle Tone, With Any Injuries Such As Fractures Or Dislocations Of Hip Joints And Vertebrae, And The Participants Who Are Currently Taking Any Treatment For Any Musculoskeletal Conditions Were Excluded.

Materials Used

- Inch Tape Or Scale
- Weighing Machine

Procedure

Formerly To Receive The Ethical Board Clearance Letter From The Ethical Board Of Srinivas University, Sample Collection Was Started In Accordance With The Inclusion And Exclusion Criteria. The Subjects Were Collected From Different Geographical Representations In Mangalore. The Objective Of The Study And The Process Were Thoroughly Explained To Each Participant. Subjects Were Asked To Read And Sign The Consent Form Before Participating In The Study. The Participant’s Informed Consent Was Obtained, Then The Subject's Height And Weight Were Recorded For Calculating The BMI, And They Were Categorized Into Underweight, Normal Overweight, And Obese. Following That, A GPAQ Was Taken To Find Out The Activity Level Of The Subject. The Questionnaire Was Explained To The Subject, And Instructions Were Given. Once The GPAQ Is Filled Out, The Subject’s Hip Flexors Are Assessed Using The Modified Thomas Test. The Procedure Was Explained To The Subject. Previously, The Subject Would Be Positioned In A High Sitting Position With Their Gluteal Folds On The Edge Of The Couch. Before Assisting The Patient To Lay Back On The Table With Their Knee Flexed, The Examiner Places One Hand Behind Their Knee And The Other Behind Their Back. On The Side Being Tested, The Clinician Stabilizes The Asis Using Posterosuperior Force. The Pelvis Was Kept In A Neutral Posture By This Stabilizing Force. Hip Flexors May Seem To Be Of Adequate Length, Producing A False Negative If The Pelvis Is Not Stable And Tilts Anteriorly. The Patient Carefully Dropped The Testing Leg, Letting It Extend As Far As It Could While Keeping The Non-Testing Leg Flexed Towards The Chest. The Examiner Measures The Distance Between The Mid-Thigh And The Couch Using An Inch Tape Or Scale, And The Range Of Motion Of The Knee On Both Sides Is Taken. Statistical Analysis Was Done After Collecting The Data Using

Outcome Measures

Modified Thomas Test: The Modified Thomas Test Is A Clinical Assessment Used To Evaluate Hip Flexor Muscle Tightness, Specifically The Iliopsoas Muscle. The Modified Thomas Test Is A Quick And Simple Way To Assess The Flexibility Of The Hip Flexor Muscles. It's Important To Note That While This Test Can Provide Valuable Information, It Should Be Interpreted Within The Context Of The Patient's Overall Condition And In Combination With Other Assessments. The Test Procedures Was Explained To The Subject. Perform Screening Of Health Risks And Obtain Informed Consent. Perform An Appropriate Warm-Up. The Subject Sits On The Bench's Very Edge, Then Rolls Back Onto It While Pulling Both Knees To The Chest. This Is Done To Ensure That The Lumbar Spine Is Flat On The Bench And The Pelvis Is Rotated Posteriorly. The Subject Then Holds The Opposite Hip In Full Flexion With The Arms While Lowering The Limb To Be Tested To The Floor. Then The Examiner Measures The Distance Between The Couch And The Thigh [18].

Result

A Comprehensive Investigation Involving 385 Individuals, With An Average Age Of 21.86 Years Included An Evaluation Of Anthropometric Attributes, Encompassing Height, Weight, And BMI, Which Were Consolidated In Table 1.

Table 1: Descriptive Overview Of Variables

		Mean	Sd	Maximum	Minimum
Age		21.86	1.54	25	18
Gender		1.47	0.50	2.00	1.00
Height		163.01	7.42	185	145
Weight		60.94	7.54	80	36
BMI		23.00	2.97	33.78	13.70
Distance Between Thigh And Couch	**Right**	4.74	1.96	12	0
	Left	5.26	2.00	10	0
GPAQ		598.14	134.60	830	300

Table 1 Encapsulated The Statistical Overview Of The Participants' Anthropometric Characteristics. Within The Participant Cohort, There Were 201 Females And 184 Males. The Average Height Registered At 163.01±7.42 Cm, Accompanied By A Mean Weight Of 60.94 ±7.54 Kg. The Collective Average BMI Of The Group Stood At 23.00±2.97kg/M². Utilizing The Modified Thomas Test, The Study Gauged Iliopsoas Tightness By Assessing The Distance Between The Posterior Thigh And The Couch For Both The Leg. The Mean Distance Between The Thigh And Couch Was Computed As 4.74 ± 1.96 For The Right Leg And 5.26 ± 2.00 For The Left Leg Respectively. Iliopsoas Tightness Identification Hinged On Modified Thomas Test Measurements, Wherein Individuals Exhibiting Any Values For The Measurement Of Distance Between Thigh And Couch Found Out To Be Having Iliopsoas Tightness. Of The Participants, 363 Individuals (94.3%) Showcased Signs Of Iliopsoas Tightness Either In Their Right Or Left Leg, According To The Modified Thomas Test. This Outcome Underscores The Substantial Prevalence Of Iliopsoas Tightness Among Young Adults. Among These 363 Individuals With Tightness, 247 Of Them

Are Having Tightness In The Dominant Side And 116 Are Having Tightness In The Non-Dominant Side. So, The Prevalence Of Dominant Side Tightness Over The Non- Dominant Side Is About 68.04%.

For The Purpose Of Scrutinizing Correlations Between The Tightness Category And Various Factors Within The Same Participant Pool, The Ensuing Relationships Emerged:

A Strong Negative Correlation (-0.103) Has Been Found Out Between The GPAQ And BMI In The Prevalent Young Adults (362/385) With Respect To Their Right Side. The P-Value (0.051) Associated With The Correlation Coefficient, Which Is Slightly Above The Common Significance Level Of 0.05. This Suggests That The Correlation Coefficient Might Not Be Statistically Significant At The Conventional Significance Level, But It Is Close. There Is A Strong Negative Correlation (-0.479) Between GPAQ And Distance Between The Thigh And Couch.

Discussion

The Information Provided Discusses The Findings Of A Comprehensive Investigation Involving 385 Individuals, With A Focus On Anthropometric Attributes Such As Age, Gender, Height, Weight, BMI, And An Iliopsoas Tightness Measurement. The Investigation Also Look Into The Relationships Between These Characteristics, Particularly GPAQ (Which Appears To Be A Measure Of Physical Activity), And The Above Variables. The Presented Findings Shed Light On Various Aspects Of The Study's Participant Cohort And Findings. Let Us Examine The Implications And Potential Discussions For Each Of These Outcomes.

Discussion Implications

- Present Study Noted High Prevalence Of Iliopsoas Tightness Among Young Adults, Which Consists Of 64.14% Of Individuals With Tightness Over The Dominant Side And 30.12% Individuals With Tightness In Their Non-Dominant Side. Iliopsoas Tightness In Young Adults Can Result From A Combination Of Lifestyle Factors, Anatomical Considerations, And Muscle Imbalances. Prolonged Periods Of Sitting, Often Associated With Desk Jobs, Studying, Or Screen Time, Can Lead To Shortening And Tightening Of The Iliopsoas Muscles [19]. This Occurs Because The Muscles Are In A Shortened Position For Extended Durations. Inactive Lifestyles With Little Physical Activity Or Exercise Can Lead To Muscle Imbalances And Decreased Flexibility. A Lack Of Regular Movement Can Contribute To Iliopsoas Muscle Tightness Throughout The Body [1,3,4]. The Dominant Side Of The Body Is Stronger And More Developed Than The Non-Dominant Side, Which May Explain Why Tightness Is More Common On The Dominant Side. Muscle Imbalances Can Cause Abnormal Movement Patterns And Overuse Of Specific Muscles, Potentially Resulting In Tightness In The Hip Flexors On The Dominant Side. If The Non-Dominant Side Is Injured Or Weak, The Dominant Side May Compensate By Taking On More Load And Work. This Can Put Additional Strain On The Hip Flexors On The Dominant Side, Resulting In Tightness Over Time. Prolonged Sitting Can Cause Hip Flexor Tightness, Particularly If A Person Crosses One Leg Over The Other Or Sits With Uneven Weight Distribution. People Often Unconsciously Do This More On Their Dominant Side. Hip Flexor Tightness On The Non-Dominant Side Can Also Be Attributed To Various Factors That Affect Muscle Balance, Biomechanics, And Lifestyle. Muscle Imbalances On The Non-Dominant Side Can Occur In The Same Way That They Do On The Dominant Side. If The Non-Dominant Side Is Weaker Or Less Developed, The Hip Flexors On That Side May Become Tight As Other Muscles Compensate [20].

- The Participants' Reported Average Height, Weight, And BMI Indicate A Relatively Healthy And Normal Distribution Of These Attributes. This Data Could Be Used As A Starting Point For Future Studies Or Comparisons With Other Populations. While Having A Bmi Within The Healthy Weight Range Is A Good Thing, It's Also Important To Consider Other Factors That Can Affect Health, Such As Muscle Mass, Fat Distribution, And Overall Fitness.
- The High Prevalence Of Iliopsoas Tightness (94.3% Of Participants) Among Young Adults Is Noteworthy. This Points To A Potential Musculoskeletal Health Issue In This Age Group. Further Discussions Could Look Into The Potential Causes Of Such A High Prevalence, Such As Lifestyle Factors, Sedentary Behaviour, Occupational Influences, And So On. Furthermore, Addressing The Potential Consequences Of Iliopsoas Tightness On Overall Health And Mobility Could Provide Useful Context.
- The Strong Negative Correlations Between GPAQ And Thigh-To-Couch Distance Raise Concerns About The Relationship Between Physical Activity And Flexibility Or Tightness. This Finding Suggests That Increased Physical Activity May Help With Flexibility. The Clinical Rationale Behind This Is The Direct Relationship Between Physical Activity And Muscle Functioning. If The Individual's Physical Activity Is Less, The Muscle Fibers Will Go Into A Shortened Position, Which Results In The Tightness Of That Particular Muscle.
- Practical Applications: The Findings Could Inform Health Professionals And Fitness Trainers About The Potential Benefits Of Addressing Iliopsoas Tightness Through Tailored Interventions, Especially Among Individuals With Lower Physical Activity Levels.
- Limitations: Any Limitations Of The Study, Such As Sample Size, Potential Confounding Variables Like BMI, Height, Weight, Hip Flexion Rom That Are Not Accounted For, Or The Reliance On Self-Reported Physical Activity (GPAQ), Should Be Acknowledged.

The Mentioned P-Values Are Slightly Higher Than The Conventional Threshold, Which Brings Up A Discussion About Statistical Significance. While The Correlations Might Not Reach The Standard Threshold, They Could Still Hold Practical Importance. Discussing The Potential Implications Of These Correlations, Even If They Are Not Statistically Significant, Can Contribute To A Comprehensive Understanding Of The Results.

Conclusion

The Comprehensive Investigation Involving 385 Individuals Revealed Significant Insights Focusing On Iliopsoas Tightness. The Study Underscored The Prevalence Of Iliopsoas Tightness Among Young Adults And Its Potential Links To Lifestyle, Muscle Imbalances, And Sedentary Behaviours. The Prevalence Was Found Out As 94.3% In The Population Of Young Adults. The Correlations Between Physical Activity And Flexibility Highlighted The Importance Of Staying Active For Maintaining Muscle Function. The Findings Hold Implications For Musculoskeletal Health In Young Adults And Could Guide Tailored Interventions.

Appendix

GPAQ (Global Physical Activity Questionnaire)

Physical Activity

I Am Going To Ask You About The Time You Spend Doing Different Types Of Physical Activity In A Typical Week. Please Answer These Questions Even If You Do Not Consider Yourself To Be A Physically Active Person.
Think First About The Time You Spend Doing Work. Think Of Work As The Things That You Have To Do Such As Paid Or Unpaid Work, Study/Training, Household Chores, Harvesting Food/Crops, Fishing Or Hunting For Food, Seeking Employment. [Insert Other Examples If Needed]. In Answering The Following Questions 'Vigorous-Intensity Activities' Are Activities That Require Hard Physical Effort And Cause Large Increases In Breathing Or Heart Rate, 'Moderate-Intensity Activities' Are Activities That Require Moderate Physical Effort And Cause Small Increases In Breathing Or Heart Rate.

Questions		Response	Code
Activity At Work			
1	Does Your Work Involve Vigorous-Intensity Activity That Causes Large Increases In Breathing Or Heart Rate Like [Carrying Or Lifting Heavy Loads, Digging Or Construction Work] For At Least 10 Minutes Continuously? [Insert Examples] (Use Showcard)	Yes 1 No 2 If No, Go To P 4	P1
2	In A Typical Week, On How Many Days Do You Do Vigorous-Intensity Activities As Part Of Your Work?	Number Of Days ⌊__⌋	P2
3	How Much Time Do You Spend Doing Vigorous-Intensity Activities At Work On A Typical Day?	Hours: Minutes ⌊__⌋⌊__⌋ : ⌊__⌋⌊__⌋ Hrs Mins	P3 (A-B)
4	Does Your Work Involve Moderate-Intensity Activity That Causes Small Increases In Breathing Or Heart Rate Such As Brisk Walking [Or Carrying Light Loads] For At Least 10 Minutes Continuously? [Insert Examples] (Use Showcard)	Yes 1 No 2 If No, Go To P 7	P4
5	In A Typical Week, On How Many Days Do You Do Moderate-Intensity Activities As Part Of Your Work?	Number Of Days ⌊__⌋	P5

6	How Much Time Do You Spend Doing Moderate-Intensity Activities At Work On A Typical Day?	Hours: Minutes ⌊_⌋⌊_⌋ : ⌊_⌋⌊_⌋ Hrs Mins	P6 (A-B)

Travel To And From Places			
The Next Questions Exclude The Physical Activities At Work That You Have Already Mentioned. Now I Would Like To Ask You About The Usual Way You Travel To And From Places. For Example, To Work, For Shopping, To Market, To Place Of Worship. [Insert Other Examples If Needed]			
7	Do You Walk Or Use A Bicycle (Pedal Cycle) For At Least 10 Minutes Continuously To Get To And From Places?	Yes 1 No 2 If No, Go To P 10	P7
8	In A Typical Week, On How Many Days Do You Walk Or Bicycle For At Least 10 Minutes Continuously To Get To And From Places?	Number Of Days ⌊_⌋	P8
9	How Much Time Do You Spend Walking Or Bicycling For Travel On A Typical Day?	Hours: Minutes ⌊_⌋⌊_⌋ : ⌊_⌋⌊_⌋ Hrs Mins	P9 (A-B)
Recreational Activities			
The Next Questions Exclude The Work And Transport Activities That You Have Already Mentioned. Now I Would Like To Ask You About Sports, Fitness And Recreational Activities (Leisure), [Insert Relevant Terms].			
10	Do You Do Any Vigorous-Intensity Sports, Fitness Or Recreational (Leisure) Activities That Cause Large Increases In Breathing Or Heart Rate Like [Running Or Football,] For At Least 10 Minutes Continuously? [Insert Examples] (Use Showcard)	Yes 1 No 2 If No, Go To P 13	P10
11	In A Typical Week, On How Many Days Do You Do Vigorous-Intensity Sports, Fitness Or Recreational (Leisure) Activities?	Number Of Days ⌊_⌋	P11
12	How Much Time Do You Spend Doing Vigorous-Intensity Sports, Fitness Or Recreational Activities On A Typical Day?	Hours: Minutes ⌊_⌋⌊_⌋ : ⌊_⌋⌊_⌋ Hrs Mins	P12 (A-B)

Physical Activity (Recreational Activities) Contd.				
Questions		**Response**		**Code**
13	Do You Do Any Moderate-Intensity Sports, Fitness Or Recreational (Leisure) Activities That Causes A Small Increase In Breathing Or Heart Rate Such As Brisk Walking (Cycling, Swimming, Volleyball) For At Least 10 Minutes Continuously? [Insert Examples] (Use Showcard)	Yes	1	P13
		No	2 If No, Go To P16	
14	In A Typical Week, On How Many Days Do You Do Moderate-Intensity Sports, Fitness Or Recreational (Leisure) Activities?	Number Of Days	⌊__⌋	P14
15	How Much Time Do You Spend Doing Moderate-Intensity Sports, Fitness Or Recreational (Leisure) Activities On A Typical Day?	Hours: Minutes	⌊__⌋⌊__⌋ : ⌊__⌋⌊__⌋ Hrs Mins	P15 (A-B)
Sedentary Behaviour				
The Following Question Is About Sitting Or Reclining At Work, At Home, Getting To And From Places, Or With Friends Including Time Spent [Sitting At A Desk, Sitting With Friends, Travelling In Car, Bus, Train, Reading, Playing Card Or Watching Television], But Do Not Include Time Spent Sleeping. [Insert Examples] (Use Showcard)				
16	How Much Time Do You Usually Spend Sitting Or Reclining On A Typical Day?	Hours: Minutes	⌊__⌋⌊__⌋ : ⌊__⌋⌊__⌋ Hrs Min S	P16 (A-B)

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