

Self-Efficacy, Self-Confidence, and Physical Appearance in Relation to the Activities Performed by Adolescents

Sumit Rathee

Department of Physical Education, Kalinga University, Raipur, Chattisgarh, India, 492101

E-mail ID: sumitrathee570@gmail.com

Abstract— Purpose: The primary objective of this investigation was to scrutinize the psychological determinants that play a role in shaping the physical activity patterns of adolescents at the age of 15. These psychological factors under examination encompassed self-efficacy, physical self-confidence, and physical appearance. **Methodology:** The study cohort consisted of 2277 adolescents, all aged 15, comprising 1086 boys and 1191 girls. An assortment of carefully chosen inquiries and measurement scales were sourced from the internationally recognized standard questionnaire developed by the HBSC initiative. The toolkit incorporated the utilization of the General Self-Efficacy Scale as well as the specialized Physical Appearance Subscale, collectively facilitating a nuanced exploration into various dimensions of physical activity engagement, self-efficacy beliefs, and subjective evaluations of bodily attributes. **Findings:** The study unveiled that a considerable proportion of the 15-year-old populace in India fell short of attaining an adequate level of physical activity. Remarkably, self-efficacy, physical appearance, and self-confidence concerning both mass and body appearance emerged as significant predictors of the observed physical activity patterns. Furthermore, the gender factor was identified as introducing a nuanced variation in the predictive roles of these factors. **Implications:** Evidently, psychological variables can wield a predictive influence over the physical activity trends displayed by adolescents at the age of 15. This exploration underscores the intricate interplay between psychological aspects and physical activity, suggesting a potentially pivotal avenue for tailored interventions and strategies aimed at promoting healthier activity levels among this specific demographic.

Keywords— Physical Activities, Self-Efficacy, Adolescent phase, Physical Appearance, Self-Confidence.

I. INTRODUCTION

The prevailing dataset pertaining to the levels of physical activity (PAL) among the youth presents a disconcerting picture. Despite the prolonged existence of initiatives targeting the augmentation of physical activity levels among adolescents, only a scant few have managed to yield outcomes of a satisfactory nature. This verifiable success is primarily attributed to the unwavering persistence exhibited by select programs, which have been able to empirically substantiate a favorable impact on physical activity, particularly during the formative stages of adolescence. The consequential ramifications extend to the domains of health, and the overall quality of life during the later phases of adulthood and advanced age. Traditionally, endeavors to influence the physical activity trajectories of adolescents have often taken the form of infrastructure investments. This encompasses the modernization and establishment of recreational spaces, sports fields, and diverse facilities. Additionally, endeavors were dedicated to optimizing the curriculum of physical education classes. Nevertheless, recent strides in scientific inquiry have unveiled a nuanced reality, wherein these conventional interventions exhibit limitations in their efficacy.

The principal objective of this investigation was to proactively identify and meticulously examine determinants beyond the scope of environmental influences that possess the potential to substantially elevate the levels of physical activity among adolescents, thereby instigating enduring and favorable outcomes. The discernment of these determinants is a multifaceted endeavor, encompassing diverse dimensions that contribute to the characterization of factors impacting physical

activity. A prominent emphasis is placed on the psychological facets of this paradigm. In particular, this study casts a spotlight on determinants aligned with the profound underpinnings of Bandura's seminal social learning theory, which forms the bedrock upon which this research is strategically anchored.

In pursuit of this endeavor, a comprehensive approach amalgamating the tenets of social learning theory and self-efficacy theory was meticulously employed. This sophisticated approach was adeptly designed to underscore the intricate interplay of a myriad of individual, environmental, and behavioral factors that intricately converge. By employing such a perspective, the scrutiny is thoughtfully directed towards the pivotal role of self-regulatory processes that significantly shape an array of behaviors, with a specific focus channeled towards physical activity as a coherent entity. In this contextual framework, the paramount significance of psychological facets, notably self-efficacy, and Self-Confidence, is prominently accentuated. This serves as a compelling departure from the unidimensional paradigms characterizing prior studies fixated solely on tangible factors. Moreover, this nuanced approach unveils a plethora of hitherto unexplored variables capable of molding the trajectories of physical activity levels. Central to the delineated exploration is the pivotal concept of self-efficacy, characterized by the sanguine conviction in one's potential to execute actions aligned with chosen objectives. This unwavering belief remains unstayed by encountered impediments and adversities, encompassing the conviction that actions can yield desired outcomes. Notably, self-efficacy assumes a multifaceted role, empowering individuals not only to initiate action but also to discern optimal effort exertion.

Furthermore, it emboldens them to persevere despite potential setbacks and obstacles.

The dynamic influence of self-efficacy encompasses profound implications for emotional states and behavioral responses. Individuals harboring diminished self-efficacy tend to grapple with an array of negative emotions, including heightened anxiety, pervasive helplessness, despondency, and even manifest signs of severe depression. Conversely, an elevated level of self-efficacy heralds enhanced capacities for astute decision-making, adept task execution, proficient information assimilation, and the orchestration of coherent goal pursuits. This heightened self-assuredness fundamentally steers the allocation of effort dedicated to mitigating dissonance between action outcomes and envisioned objectives. Moreover, it serves as the linchpin dictating the judicious allocation of cognitive resources, adeptly gauging prevailing circumstances, and orchestrating adaptive coping strategies when confronted with challenges intrinsic to the pursuit of aspirations. A salient hallmark of individuals fortified with self-efficacy lies in their disposition towards nurturing positive affectivity while concurrently minimizing the onslaught of negative emotions.

Significantly, self-efficacy emerges as a pivotal catalyst for augmenting problem-solving belief systems, thereby invigorating the intrinsic motivation requisite for goal formulation and galvanizing proactive initiatives. This endowed self-efficacy reservoir induces a surge in volitional engagement, enabling individuals to bolster their commitment and exertion in the face of impediments or less-than-desirable outcomes. Remarkably, even amid the disheartening throes of failure, individuals fortified with robust self-efficacy display a remarkable penchant for reinvigoration, rallying their endeavors anew. In stark contrast, individuals ensnared within the confines of feeble self-efficacy often succumb to inertia, despondency, and forsaking their aspirations altogether. Evidently, the influence of self-efficacy transcends both direct and indirect realms, wielded as a transformative force that profoundly shapes health-conscious behavioral selections, encapsulating the realm of physical activity.

An additional pivotal determinant illuminated within the corpus of literature scrutinizing the physical activity levels of adolescents is Self-Confidence. This intricate concept encapsulates the profound sentiments individuals harbor regarding their intrinsic sense of self, a construct intricately woven from a myriad of psychological facets. It exerts a salient influence on the behavioral propensities exhibited by individuals. The composition of Self-Confidence is multifaceted, characterized by divergent dimensions that encompass domains such as appearance, knowledge, intelligence, and specific proficiencies. However, it is noteworthy that the relative significance of these dimensions may vary considerably for each individual. The assessment of Self-Confidence can be undertaken through intentional channels, involving the deliberate solicitation of information concerning one's competencies, often realized through task execution. Conversely, unintentional evaluation mechanisms also contribute, emanating from introspective self-assessment or external evaluation by others. This amalgamation of diverse sources culminates in the aggregation of global Self-

Confidence, encapsulating the entirety of its constituent elements. An additional layer of distinction within the landscape of physical activity manifests through the prism of Physical Appearance, a concept anchored in the internal representation of one's external physical form. This perceptual schema is inextricably intertwined with the emotional realm, influencing cognitive thoughts and affective experiences. Notably, the tenor of an individual's Physical Appearance, whether characterized by positivity or negativity, wields the capacity to precipitate a spectrum of emotional responses, ranging from affirmative sentiments to bouts of despondency. In instances where Physical Appearance skews toward the negative spectrum, it may even contribute to the onset of behavioral irregularities stemming from an excess of detrimental emotional experiences.

II. LITERATURE REVIEW

Utilizing longitudinal data from the Motorik-Modul (MoMo) Longitudinal Study, this investigation conducted by Jekauc et al. (2017), delved into the bidirectional interplay between motor abilities and physical activity, further illuminated by the intricate mediation role of physical self-concept. Within this scholarly pursuit, a cohort of 335 boys and 363 girls, aged 11 to 17 years at Baseline, journeyed through a six-year odyssey of inquiry. The canvas of exploration was embellished with multifaceted instruments: the MoMo Physical Activity Questionnaire captured the essence of youthful dynamism, the Physical Self-Description Questionnaire unraveled the tapestry of self-perceived physical prowess, and the MoMo Motor Test unveiled dimensions of strength, endurance, coordination, and flexibility. Employing the orchestrations of multiple regression analyses, a symphony of findings emerged. The nexus between motor abilities and physical activity unveiled indirect pathways of influence for strength, coordination, and flexibility, while endurance remained unadorned by direct or indirect effects. Conversely, the effects of physical activity upon motor abilities found a resonating echo in the self-concept of strength, enacting a partial mediation. A similar chorus of indirect mediating forces emerged for the dimensions of endurance, coordination, and flexibility. In this choreography of reciprocal influences and mediating nuances, the study contributes a melodic refrain to the symphony of human kinetics and self-perception. (Hagger et al., 2001) delved into the intricate interplay of factors shaping young individuals' intentions towards engaging in physical activity, augmenting Ajzen's Theory of Planned Behavior as its conceptual framework. The primary aim was to discern the influence of self-efficacy and past behavior within this theoretical paradigm. The researchers postulated that self-efficacy would stand distinct from perceived behavioral control and uniquely elucidate variance in intentions for physical activity. Furthermore, they anticipated that past physical activity behavior would temper the impact of attitude, subjective norms, perceived behavioral control, and self-efficacy on intention. The cohort under scrutiny encompassed 1152 young participants, aged 13.5 to 16.6 years, with a mean age of 14.0. These individuals meticulously completed inventories gauging their intentions, attitudes, subjective

norms, perceived behavioral control, self-efficacy, and prior physical activity behavior. Through the prism of confirmatory factor analysis, the constructs delineated by the Theory of Planned Behavior unveiled their distinctiveness. The concurrent validity of the theory's measures was further buttressed by significant associations between attitudes, subjective norms, perceived behavioral control, self-efficacy, and their corresponding belief-based metrics. A novel SEM, deviating from the conventional norms, unveiled the intricate tapestry of influence. Within this intricate web, it was discerned that attitudes and self-efficacy emerged as potent predictors of physical activity intention, while perceived behavioral control and subjective norms did not manifest such influence. Notably, the role of self-efficacy transcended its initial conjecture, attenuating the sway of attitudes and perceived behavioral control upon intention. Moreover, past behavior exerted a direct and indirect sway upon intention, mediated by self-efficacy and attitude. In this multidimensional symphony of intentions, attitudes, and self-efficacy, underscored by the subtle interplay of past behavior, the study illuminates the complex dynamics underpinning young individuals' aspirations for physical activity. Through a systematic review of relevant literature, a concept analysis was orchestrated by (Voskuil & Robbins, 2015) to forge a comprehensive delineation of youth physical activity self-efficacy. Guided by Rodger's evolutionary method, the analysis dissected the concept's nuances and dimensions. The outcome illuminated a profound comprehension of youth physical activity self-efficacy. In light of these insights, the authors advocate for future endeavors to converge on uniform conceptual definitions and empirical gauges of this construct. Such concerted efforts are poised to catalyze interdisciplinary advancement and refinement of the concept. (Voskuil et al., 2017) conducted a meticulous comparative analysis of two distinct self-efficacy tools pertaining to physical activity. Focusing on key psychometric properties, it scrutinized factor validity, cross-group comparability, longitudinal consistency, and composite reliability. The empirical investigation harnessed data from a group randomized controlled trial encompassing 5th–8th grade girls (N = 1,012), evaluating a 17-week intervention's impact on boosting moderate to vigorous physical activity. The chosen instruments, a 6-item PASE and a 7-item SEEB underwent rigorous confirmatory factor analyses within intervention and control groups. Intricate assessments of model fit incorporated multiple indices, such as chi-square, comparative fit, and root mean square error of approximation. Composite reliability, a critical facet, was rigorously gauged, with SAS 9.3 employed for latent factors characterized by ordinal indicators. The study's cohort exhibited a mean age of 12.2 years, with a notable subset of obese participants. A diverse representation was evident, with a significant proportion identifying as black race, complemented by mixed or other racial backgrounds. Notably, both instruments demonstrated robust configural invariance, a hallmark of stability, in simultaneous cross-group and longitudinal analyses, as indicated by alternative fit indices. However, while partial metric invariance was achieved for the PASE, one factor was met for the SEEB, with subtle nuances in factor loadings identified. Furthermore, longitudinal scalar

invariance emerged triumphant for both instruments in the control group, a testament to their stability over time. The PASE showcased commendable composite reliability, spanning 0.772 to 0.842, while the SEEB exhibited a range of 0.719 to 0.800, with the former demonstrating higher reliability. Notably, reliability displayed greater constancy across time within the control group for both instruments, underscoring their robustness. In essence, this study offers a nuanced exploration into the intricate psychometric underpinnings of self-efficacy instruments, unraveling their complex interplay within the dynamic context of physical activity assessment and intervention.

Interdependencies between Physical Appearance and Self-Confidence yield a reciprocal synergy, as underscored by findings gleaned from Harter's seminal investigations. Notably, these empirical endeavors elucidate a robust interlinkage between Self-Confidence and Physical Appearance. The intrinsic fabric of Self-Confidence intricately incorporates Physical Appearance, thus bestowing upon the latter a pivotal role in the holistic tapestry of mental well-being, an influence permeating the entirety of an individual's lifespan. The primary objective of this study resided in elucidating the paramountcy of self-efficacy, Self-Confidence, and Physical Appearance as pivotal discriminants exerting profound sway over the levels of physical activity amidst a cohort of 15-year-old adolescents. Guided by this overarching aim, the investigation aimed to address a series of insightful research inquiries:

1. How is the nexus between the levels of physical activity and the self-efficacy perceptions of 15-year-olds established?
2. What intricate threads weave the relationship between the physical activity levels of 15-year-olds and their perceptions regarding body weight, appearance, and overall physical appearance?
3. Do the intricate interplays between the physical activities of 15-year-olds and the aforementioned psychological constructs evince variations contingent upon gender distinctions?

III. METHODOLOGY

To address the research inquiries, the study used a diagnostic poll, employing a questionnaire survey as the primary research approach. The evaluation tool utilized was the internationally recognized HSBC questionnaire, as established by the WHO Cross-national Collaborative Study in 2006. This questionnaire is designed to assess health behaviors among youth of school age. The assessment of physical activity levels was facilitated through the utilization of the MVPA indicator, a metric that categorizes physical activity into moderate to intense levels, involving activities that raise the heart rate and, at times, lead to brief periods of breathlessness. This approach was selected as it effectively determines the overall extent of the activity. The focal inquiries were designed to quantify the extent of physical activity, denoted by the number of days within the preceding week dedicated to engaging in physical activities lasting a minimum of 60 minutes. These questions were adopted from a screening assessment, a framework endorsed by the HSBC network following an array of pilot and validation studies. In response, adolescents were prompted to

indicate their level of activity across a visual scale spanning from 0 to 7 days.

In accordance with the multidimensional analysis undertaken, the quantified physical activity level was subsequently transformed into a binary classification. In this classification, a value of 0 signified an adequate level of physical activity, while a value of 1 indicated inadequate physical activity. The criterion for insufficient physical activity was defined as an engagement in physical activities on fewer than five days, each session lasting at least 60 minutes.

To evaluate individuals' perceived self-efficacy, the research employed Schwarzer's General Self-Efficacy Scale. Its prior application encompassed investigations into health behavior and its enduring consequences, substance abuse prevention, and the evaluation of adaptive capacities. The cumulative score from the Scale, subjected to a distribution analysis, was segregated into 3 distinct categories: a diminished sense of "self-efficacy (0–15 points), a moderate sense of self-efficacy (16–20 points), and a pronounced sense of self-efficacy (21–30 points)." Subsequent scrutiny of the scale's psychometric attributes yielded reliable outcomes. Cronbach's alpha was 0.850, attesting to the scale's internal consistency, while factor analysis illuminated a shared factor for 44%.

Self-Confidence was operationalized through the lens of three distinct dimensions: an appraisal of one's weight, an evaluation of physical appearance, and a gauge of physical appearance perception – the way one views their own physique. Respondents interacted with the survey questions using either individual descriptive responses or assigning ratings to reflect their sentiments along a designated scale. The assessment of personal weight perception involved the query, "How would you characterize your body...?", prompting individuals to choose from options such as "much too thin," "a bit too thin," "about the right size," "a bit too fat," and "much too fat." In tandem, the exploration of self-perceived appearance entailed the question, "How do you view yourself...?", permitting respondents to select from a range of possibilities including "good looking," "quite good looking," "about average," "not very good looking," and "not at all good looking."

The comprehensive exploration of Physical Appearance was undertaken through the judicious employment of the BIS, an integral facet of the extensive Body Investment Scale tailored to capture the nuanced perceptions individuals harbor toward their own corporeal form. Remarkably, the present study orchestrated a refined adaptation of the BIS, heralding a pioneering foray into its application within the very contours of the 2006 HSBC survey. Embodied within the BIS's fabric are six finely delineated partial evaluations, collectively amalgamating into a scalar range spanning from 0 to 24 units. This scalar panorama is astutely partitioned into a triadic assemblage, thereby encompassing: an echelon of meager valuation denoting 0 to 14 units, emblematic of a confluence with unfavorable body perception; a tier ascending from 15 to 20 units, emblematic of an equipoised and middling perception; and, resplendently, a tier cresting from 21 to 24 units, signifying an exalted and sanguine Physical Appearance. It is salient to underscore that this metric divulged tenacious comportment, bedecked with the imprimatur of psychometric virtuosity, its

mettle encapsulated by a venerable Cronbach's alpha coefficient of 0.853. The lodestar of this prodigious variance, a singular factor, commanded dominion, elucidating 58% of the total ontological tapestry. Within this scholarly odyssey, an assembly of 2287 stalwart disciples of learning, hailing from both the masculine and feminine cadres, conjoined in the tapestry of tertiary education. Notably in their third annal, these scholarly pilgrims, ardently devoted to the path of knowledge, were culled at random, their selection anointed by the rigorous aegis of the Ministry of Education's scroll and the hallowed annals of a prior HSBC exposé executed in the year of 2002. A symphony orchestrated by the grades of these aspirants, their quantum from each precinct of Poland harmonized in syncopation with its demographic philharmonic, a chorus resonating in consonance with the urban cadence each precinct espoused. Yet, akin to the fabled alchemist's quest, certain fragments of this mosaic bore lacunae, a circumstance that conferred a singular distinction upon the final cohort for analysis, endowed with the numerical badge of $N = 2277$, whence 1086 valiant knights and 1191 fair maidens converged. The rubric of statistical significance, anointed by the regal scepter of $p = 0.05$, governed with magisterial certitude.

IV. ANALYSIS AND RESULTS

The study conducted among Polish adolescents revealed a noteworthy prevalence of insufficient physical activity, affecting nearly 65% of the examined 15-year-olds. Notably, a distinct gender disparity emerged, with a considerably higher proportion of girls exhibiting insufficient physical activity compared to boys (Tab. 1). The investigation sought to establish a discernible link between the participant's physical activity levels and specific psychological factors such as self-efficacy and Self-Confidence related to body weight, appearance, and Physical Appearance. Logistic regression models were developed for each psychological variable, followed by an encompassing model considering the cumulative psychological aspects. Remarkably, the analysis unveiled a significant association between self-efficacy and physical activity levels in adolescents. "Individuals characterized by lower self-efficacy demonstrated heightened vulnerability to inadequate physical activity levels [OR = 1.42; CI(OR): 1.06–1.89, OR – odds ratio, CI – confidence interval]. Conversely, those with greater self-efficacy were notably less prone to having insufficient physical activity [OR = 0.46; CI(OR): 0.48–0.85]. The study further delved into gender-specific models, illuminating that elevated self-efficacy was linked to a diminished risk of inadequate physical activity both in males [OR = 0.62; CI(OR): 0.47–0.80] and females [OR = 0.46; CI(OR): 0.48–0.85]."

Table 1. Relationship of the level of physical activity and gender (% of 15-year-old adolescents)

Gender	Physical activity level *	
	sufficient	insufficient
Boy	45.4	54.6
Girl	26.6	73.4

* $\chi^2 = 89.401$; $df = 1$; $p = 0.0000$

Likewise, gender emerged as a factor attenuating the predictive potency of low self-efficacy, rendering it statistically insignificant within the model. This underscores the prevailing influence of gender in this context. The patterns and predictive implications pertaining to the other parameters mirrored those observed in models. Specifically, the male and elevated self-efficacy were associated with lowered risks of inadequate activities: “[OR = 0.44; CI(OR): 0.37–0.53]” and “[OR = 0.62; CI(OR): 0.52–0.76]”. Adolescents perceiving themselves as overweight exhibited an elevated susceptibility to insufficient activity “[OR = 1.71; CI(OR): 1.39–1.25]”. Gender-specific analyses upheld this association, indicating that the linkage between self-perceived excess weight and insufficient physical activity remained constant “[OR = 1.93; CI(OR): 1.27–2.71]”. However, gender-specific results indicated an additional noteworthy finding: among girls, a significant correlation emerged between perceiving oneself as thin and insufficient activity, heightening associated risks “[OR = 1.59; CI(OR): 1.04–2.42]”. Transitioning to the models incorporating gender yielded a substantial decline in goodness of fit, approaching the admissible threshold. In this context, both gender and the belief of overweight assumed heightened significance, manifesting as “[OR = 0.47; CI(OR): 0.39–0.56]” and “[OR = 1.36; CI(OR): 1.09–1.68]”, respectively.

Upon dissecting through a gender lens, it becomes evident that among boys, a pessimistic self-assessment translated to an increased vulnerability to insufficient activity “[OR = 1.90; CI(OR): 1.24–2.91]”, while a favorable self-analysis acted as a protective factor, diminishing the uncertainty “[OR = 0.74; CI(OR): 0.57–0.97]”. In the context of girls, the sole predictor for susceptibility to inadequate activity was a favorable self-analysis of physical appearance, associated notably with the reduction of the risk “[OR = 0.65; CI(OR): 0.46–0.91]”. Integrating gender into the model yielded intriguing findings. The male and a favorable analysis of physical appearance surfaced as pivotal factors curtailing the risk, with odds ratios of “[OR = 0.46; CI(OR): 0.38–0.56]” and “[OR = 0.69; CI(OR): 0.56–0.86]”. Aggregate logistic regression analysis encompassing all of them individually by examining psychological factors produced for the OR, depicted in Figure 1. Individual scrutiny underscored that the most robust safeguards against insufficient activity encompassed heightened self-efficacy, succeeded by a positive physical appearance and an unfavorable self-assessment of the appearances. Among the paramount determinants countering inadequate activity in being overweight and negative physical appearance. Ultimately, the most influential factors contributing to diminished physical activity levels in young were low self-efficacy and unfavorable physical appearance (see Fig. 1).

Upon dissecting the model encompassing gender as an influencing factor, a distinct independent correlation between gender and inadequate physical activity emerged. Remarkably, the male gender exhibited a significant reduction in the risk of encountering insufficient physical activity, demonstrated by an odds ratio of “[OR = 0.41; CI(OR): 0.34–0.50]”. Furthermore, a pessimistic perception of one's appearance yielded a noteworthy effect, substantially mitigating the likelihood of

inadequate activity “[OR = 0.58; CI(OR): 0.41–0.82]”. Conversely, an adverse self-evaluation of physical appearance was linked with escalated risks of insufficient physical activity “[OR = 1.29; CI(OR): 1.02–1.63]”. In contrast, a positive appraisal of physical appearance manifested a protective influence, markedly decreasing the odds of experiencing inadequate activity “[OR = 0.64; CI(OR): 0.52–0.79]”.

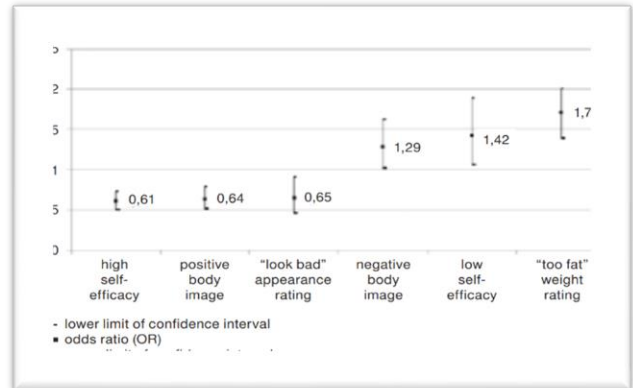


Fig. 1: Factors contributing to Physical Activities

Subsequently, when considering simultaneous effects of all psychological factors, the analysis revealed the presence of four independent determinants influencing the extent of the activity. Foremost among these variables was a pessimistic self-assessment of the appearances, showcasing the robust protective effect in opposition to insufficient activity. Following this, a heightened sense of self-efficacy and favorable Physical Appearance emerged as significant contributors to encouraging adequate activity levels. Conversely, the most potent factor indicating a heightened risk of inadequate activity was the perception of being overweight (Fig. 2).



Fig. 2: Factors heightening the risk of Overweight

Given the pronounced and autonomous relationship between activity and gender that manifested in potentially distorting the interplay of other variables, the final analytical model opted to exclude gender as a variable. Instead, the study pursued a bifurcated approach, developing distinct models for boys and girls, respectively (see Fig. 3 & 4).

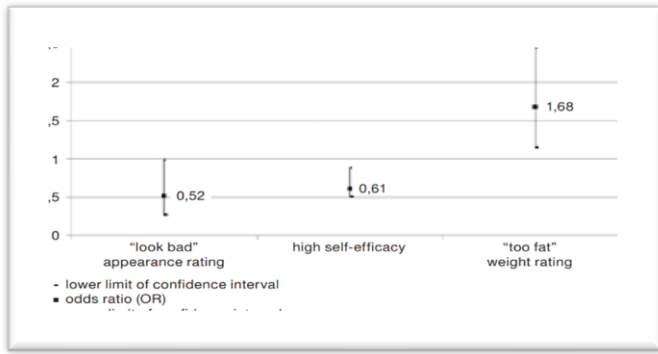


Fig. 3: Bifurcation approach for boys

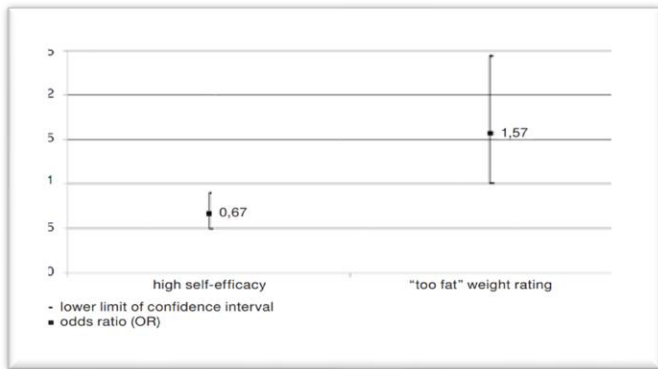


Fig. 4: Bifurcation approach for girls

In an examination specific to boys, the analysis pinpointed the presence of three distinct determinants impacting physical activity. A noteworthy observation was the prominence of self-assessment regarding appearance and self-efficacy. A critical finding was that a pessimistic evaluation of appearance, coupled with a heightened sense related to self-efficacy, acted to diminish the risk related to inadequate activity. Conversely, the conviction of overweight elevated the susceptibility to insufficient activity (see Fig. 3). On the contrary, the specifically customized framework targeting the female cohort unveiled the dominion of dual pivotal elements molding behavioral trends: self-efficacy and a self-evaluation pertaining to body mass. In precise terms, a resilient standpoint of self-efficacy exhibited a negative correlation with the likelihood of encountering activity insufficiency, whereas the cognizance of appearing excessively slender exhibited a positive association with elevated susceptibility (refer to Figure 4).

V. DISCUSSION

The initial research inquiry concerning the interplay between physical activity and the self-efficacy of 15-year-olds was comprehensively addressed through logistic regression models. These models established that self-efficacy holds the predictive capacity for physical activity, both when examining the entire adolescent population and when considering gender-specific factors. Moreover, the safeguarding impact of heightened self-efficacy against inadequate physical engagement resonated across the wider panorama of fifteen-year-old adolescents, encompassing both the overall populace

and the specific subset of adolescent girls at that age threshold. It is worth highlighting that within the male contingent, self-efficacy emerged as an independent harbinger of physical activity tiers.

The findings corroborate existing literature that underscores a favorable association between "self-efficacy" and "physical activity". In-depth investigations conducted by Rodgers et al. substantiate this correlation, while studies by Chase and George reveal that adolescents with heightened self-efficacy exhibit superior motor skills, increased determination in physical activity engagement, enhanced resilience in the face of challenges, and overall improved performance. Drawing upon Bandura's theoretical framework, the primary wellspring of self-efficacy emanates from the attainment of successful experiences in adopting and perpetuating physical activity. This implies that the remedy to counter insufficient exercise levels among adolescents lies in instigating a dual impetus: not only engaging them in physical activity but fostering a continuous and enduring commitment until self-efficacy attains a level that solidifies it as a sustained behavior. Another potent avenue for cultivating self-efficacy is through "behavior modelling", encompassing the acquisition of behaviors through observatory learning. A pivotal determinant enhancing the prospects of effective modeling revolves around the observer's resemblance to the role model in terms of "gender, age, physical fitness, and body weight". Consequently, a prospective efficacious program should commence by spotlighting less active adolescents, those initially disinclined to exercise, and those who may not exhibit immediate physical prowess or optimal body composition. This program would intricately unveil the journey of these individuals as they embark on a daily exercise regimen, personally selecting physical activities that resonate with them, and persistently adhering to their chosen routines. Notably, this journey would vividly illustrate the manifold advantages, spanning physical well-being and mental health, derived from this sustained commitment (Fig. 2).

Addressing the second and third research inquiries concerning the intricate interplay between the physical activity levels of 15-year-olds and an array of psychological facets encompassing self-evaluations of "body weight, appearance, and physical appearance", alongside the pivotal influence of gender, the findings from this study unveil a nuanced relationship. Notably, the examination demonstrates the presence of a linkage between adolescent "physical activity levels and self-confidence", specifically in the context of appearance and Physical Appearance. Concerning the realm of Self-Confidence related to appearance, the investigation identifies that an "average" perception of bodily appearance emerges as a determining factor for inadequate physical activity levels. In the context of body weight, the study elucidates that a perception of body weight falling within the realm of being "about the right size" is associated with an optimal level of physical activity. Moreover, a positive Physical Appearance emerges as a compelling determinant driving sufficient physical activity levels among both 15-year-old boys and girls.

Importantly, the qualitative inquiry conducted by Mulvihill et al. accentuates a significant revelation: the perception of "body weight, body appearance, and physical appearance"

holds more prominence than the BMI as a determinant of physical activity. This discernment underscores the critical role of individuals' self-assessments in influencing their engagement in physical activities. Intriguingly, the study illuminates a notable divergence between perceived and actual body weight, particularly emphasizing adolescents' tendencies to inaccurately gauge their own weight. Notably, teenage girls exhibit a heightened inclination to overestimate their weight compared to their male counterparts. The intricate interplay between physical appearance, weight perception, and Physical Appearance becomes even more pronounced as these factors significantly impact adolescents' mental well-being. Empirical evidence substantiates that adolescents' perception of their bodies ranks as the second most potent influencer of mental health, surpassed only by negative emotions and depression.

The findings from this study explicate a compelling association: adolescents characterized by negative Physical Appearance and reported a self-assessment of being overweight (expressed as "I am too fat") tend to exhibit insufficient physical activity. This relationship can be attributed to a reluctance to engage in recreational and sporting activities, driven by the absence of self-acceptance, thus establishing a cyclic pattern. On one hand, components of Self-Confidence, including adverse perceptions of body weight as well as Physical Appearance, impede adolescents from embracing physical activity. Conversely, optimal body weight management and control necessitate a synergy between physical activity and a balanced diet. Notably, adolescents who engage in limited physical activity while carrying excess body weight confront challenges in weight management, hindering the attainment of a favorable weight range. This predicament may lead to an escalation of body weight, consequently augmenting the risk of insufficient physical activity. This intricate process could experience disruption when an adolescent initiates a regimen of physical exercise and sustains consistent activity. Such a proactive approach can trigger a constructive cycle of positive feedback. The implementation of a systematic exercise routine emerges as a pivotal strategy to effectively address weight concerns and enhance an individual's perception of their physical competence. Notably, the achievement of favorable outcomes through exercise can instigate a surge in self-efficacy, fostering a heightened inclination to engage in additional physical activities. This, in turn, amplifies the prospects of continued weight reduction, bolstering both Self-Confidence and self-efficacy levels.

Also, the amplitude of "physical exertion" showcased a conspicuous tether to the introspective appraisal of one's visage. Intriguingly, an intriguing revelation emerged: a zenith of inadequate physical activity unveiled itself within the cohort of adolescents whose sartorial satisfaction knew no bounds. Remarkably, an astonishing tapestry unfurled, with nigh three-quarters of the fairer gender, awash in the stream of contentment with their bodily semblance, ensnared within the clutches of inadequate physical engagement. This enigmatic interlinkage beguiles conventional understanding, a riddle veiled within its paradoxical folds. A nascent hypothesis flutters its wings, suggesting that perhaps, among the adolescent fair, it is only the discontented souls who, spurred by a fervent zeal,

kindle the flames of metamorphosis, seeking refuge within the sanctuary of physical pursuits, all in their ardent endeavor to chisel and sculpt their corporeal tapestry. While dissatisfaction with appearance seems to serve as a primary driver for girls' involvement in physical activity, it's crucial not to overly emphasize this factor when seeking to boost their activity levels. It's worth noting that discontentment with appearance could potentially signal deeper underlying issues, such as more profound psychological disorders that could manifest as reduced Self-Confidence, isolation, depression, risky behaviors, and eating disorders. Therefore, a nuanced approach is recommended. Rather than exclusively focusing on appearance-related motivations, efforts should be directed toward activating and reinforcing health-oriented and pleasurable aspects of exercise. This underscores the importance of tailoring adolescent activities to cater to individual needs.

The findings highlight the interplay between adolescent physical activity and various psychological elements. However, to gain a more comprehensive understanding of these associations, further investigations are warranted to explore the efficacy of diverse strategies aimed at enhancing the activity levels of adolescents. To advance this field, future studies should be grounded in contemporary "health psychology and behavioral change" theory. Particularly, the development of theoretical frameworks, possibly in the form of "hybrid models", becomes crucial. These frameworks can holistically incorporate a spectrum of psychological factors that influence and shape physical activity behaviors among adolescents.

VI. CONCLUSION

Numerous psychological factors were identified as influential determinants of physical activity levels among adolescents. However, a particularly significant factor was gender, with girls exhibiting a higher likelihood of insufficient physical activity compared to boys. Moreover, gender played a role in shaping the impact of certain psychological variables studied. Notably, a robust sense of self-efficacy emerged as a protective factor against inadequate physical activity for both. Inadequate physical activity was also associated with negative Physical Appearance or an unfavorable perception related to body weight in adolescents. Additionally, adolescents' engagement in physical activity was influenced by their self-perceived appearance, as those content with their appearance tended to display higher rates of insufficient physical activity.

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