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# Physical activity of transsexual persons at various stages of their lives and at various stages of treatment and diagnosis

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SUMMARY

**Introduction.** The paper discusses physical activity of transsexual persons at various stages of their lives and at various stages of treatment and diagnosis.
**Aim.** The aim of the study was to find out whether consecutive stages of development and diagnosis or treatment may affect the level of physical activity in transsexuals.
**Material and methods.** The study was conducted in a group of 101 transsexuals (30 male-to-female and 71 female-to-male individuals) at various stages of diagnosis and treatment. The subjects filled in the authors' questionnaire which consisted of questions concerning physical activity. It was divided into three developmental stages and four stages of diagnosis and treatment. The information obtained was analyzed in terms of correlations, and a univariate analysis of variance was conducted.
**Results.** The level of physical activity varied markedly between female-to-male and male-to-female individuals. Physical activity occurred to be higher in the latter group at each stage of diagnosis and treatment.
In female-to-male persons, the level of physical activity increased with consecutive stages of treatment. No similar relationships were noted for both female-to-male and male-to-female respondents with respect to the stages of development. In the latter group, no such relationship was found with respect to the stage of diagnosis and treatment either.
**Conclusions.** The level of physical activity in transsexuals slightly varies depending on the stage of diagnosis and treatment. No correlations were observed with respect to the stage of development. Moreover, it was found that male-to-female and female-to-male respondents differ considerably in terms of the level of physical activity, self-acceptance and satisfaction with their bodies.
**Key words:** transsexualism, physical activity, stages of life, diagnosis and treatment

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## INTRODUCTION

Transsexualism is characterized by the inconsistency between one's perceived or identified sex and the morphological structure of one's body and sex assigned at birth [1]. This inconsistency entails profound dissatisfaction with one's assigned, biological sex and the feeling of it being wrong. Transsexual individuals wish to live and be accepted as persons with sex or gender that they perceive is right. To do this, they undertake actions aiming at adjusting their bodies to their identified gender [2,3]. These actions involve comprehensive clinical diagnosis in order to rule out factors that could affect sexual identity [4]. The subsequent step is the implementation of a life-long hormonal therapy and performance of surgical procedures in order to modify the body to match the identified sex [5–10].

Transsexualism is referred to as *gender dysphoria* (DSM-V) [11] or *gender identity disorder* (ICD-10) [12]. Currently, ICD-10 classifies it to the group of mental and behavioral disorders (F64.0). In the new ICD-11 classification, which is currently being developed, there is a new category of conditions related to sexual health which distinguishes so-called *gender incongruence* that does not pathologize the phenomenon of transsexualism [13].

Physical activity is one of the most important factors affecting health and well-being of each person. Scientists suggest that social integration in transsexuals, which has a considerable impact on health, well-being and quality of life, can be facilitated by physical exercise [14]. The basic limitations in social integration for transsexual people are barriers associated with employment, interpersonal relationships, appearance and voice perception [15].

Sexual disorientation associated with the difference between perceived and biological

gender experienced throughout childhood and adolescence as well as serious decisions taken in adulthood concerning diagnosis and treatment leading to sex reassignment, and psychological challenges related to taking such decisions may have a great impact on the level of physical activity in transsexual individuals [16]. Attention is also paid to different mood of transsexuals observed at different developmental stages. Some transsexuals recount their childhood as a time of freedom and the feeling of naturalness associated with subjectively perceived gender [17]. Other authors indicate that, even in childhood, the difference between the biological and identified sex can be a source of tension, anxiety and disorientation [18]. In adolescence, transsexual individuals undertake the first conscious attempts to identify themselves with the opposite sex by adjusting their physical appearance (body, hairstyle, clothes, etc.). This is associated with a huge psychological load, frequently including fear of the reaction expressed by the family and social environment, anxiety and abuse on the part of peers. The spectrum of psychological consequences of such a situation is broad. In many cases, it results in trauma, feeling of isolation, depression and even suicide attempts [19,20].

In adulthood, transsexuals keep experiencing problems present at earlier developmental stages. However, as adults, they frequently encounter new problems associated with their legal status and documents that they use. Unless legally corrected in documents, physical sex is exposed in various situations in the daily life, such as undertaking work, renting or purchasing a flat, buying a gym membership card or receiving mail. Problems of transsexual persons at various stages of development affect their general well-being and can indirectly influence their motivation to undertake physical activity [21,22]. Transsexual individuals wish to be perceived as persons of the opposite sex. They avoid situations in which the assigned sex could be exposed. Competition in sport is such a situation. So is using the common changing room in a gym. Another factor that differentiates physical activity in transsexual individuals can also be the stage of diagnosis and treatment.

The main field of study on physical activity of transsexual persons is gender classification in professional sport. It encompasses principles regulating admission of professional contestants and the rights of transsexual athletes. However, physical activity is not only professional sport. Recreational, non-professional physical activity concerns the vast majority of transsexuals. However, studies in this area are very rare [23].

## AIM

The aim of the study was to find out whether consecutive stages of development as well as diagnosis or treatment may affect the level of physical activity in transsexuals.

## MATERIAL AND METHODS

The presented study was correlational. It was conducted with the use of the author-prepared questionnaire. It was distributed on an internet forum devoted to transsexualism and intended for transsexual individuals, available to members only (www.transseksualizm.pl). Such a form of distribution was conducted for several reasons. First of all, transsexual individuals constitute a minority, which makes it considerably difficult to collect an adequately large group. Moreover, transsexuals who live in accordance with their identified gender frequently do not disclose this fact publicly. The survey placed online did not require the respondents to disclose their identity and was anonymous. Filling in the questionnaire was treated as consent to use the results for analyses, of which respondents were informed by means of information stated before the survey began.

The study included 101 transsexuals (30 male-to-female and 71 female-to-male individuals). The most numerous group were subjects aged 18–23 (54.5%), followed by those aged 24–28 (22.8%), and $\geq$ 29 (22.8%). The sociodemographic data are presented in Table 1.

Apart from the sociodemographic data (gender: female-to-male, male-to-female, age, place of residence, education), the survey also included questions about the diagnosis and treatment as well as surgery which the subjects considered crucial. The proper part of the survey concerned physical activity at various stages of development (part one: childhood, adolescence, adulthood) and at various stages of diagnosis and treatment (part two: before diagnosis and treatment, during diagnosis but before hormone replacement therapy, during hormone replacement therapy but before crucial surgery as well as during hormone replacement therapy and after crucial surgery). In order to characterize physical activity of respondents at various stages of life and at various stages of treatment and diagnosis, the questionnaire was developed in such a way to distinguish conse-

cutive stages of life as well as diagnosis and treatment. Respondents answered questions concerning physical activity for individual stages. An answer key was additionally made for all stages to sum up responses and create a variable specifying the level of physical activity at a given stage of life or treatment.

## RESULTS

All respondents stated at which stage of diagnosis and/or treatment they were at the time of the study. This question referred to the second part of the questionnaire; respondents did not answer questions intended for stages that they had not experienced. The groups of respondents answering questions for individual stages were similar in terms of quantity for both female-to-male and male-to-female individuals (from 13.3 to 40% for a given stage, for greater detail see Table 2).

In the male-to-female group, 40% of respondents believed that sex reassignment surgery (SRS; vaginoplasty) was the crucial procedure. Fewer respondents indicated laser hair removal and voice adjustment (16.7% for each response) and facial feminization surgery (13.3%). The fewest male-to-female respondents selected chondrolaryngoplasty and facial feminization surgery as crucial procedures.

As for the female-to-male group, most respondents believe the first of the three procedures, i.e. mastectomy, to be the crucial one (74.6%). Approximately 20% of respondents in this group indicated neophalloplasty as essential and only 5.6% selected panhysterectomy (Tab. 3).

Physical activity was calculated for each respondent in seven stages (3 developmental stages and 4 stages of diagnosis and treatment). In the male-to-female group, the average rates of physical activity for each of the stages of diagnosis and treatment were lower than in the female-to-male group. Physical activity of female-to-male individuals increased with each stage of diagnosis and treatment. This relationship was not observed in the other group. Also, no such relationship is observed in the analysis of physical activity vs developmental stages. In this case, physical activity was not observed to increase or decrease in consecutive developmental stages either in female-to-male or male-to-female individuals. In male-to-female individuals, physical activity peaks during adolescence ($\bar{x} = 9.53$), and declines in adulthood ($\bar{x} = 9.17$). As for female-to-male persons, it is the

**Tab. 1.** Sociodemographic data

| | | Frequency | % |
|---|---|---|---|
| Sex | F/M | 71 | 70.3 |
| | M/F | 30 | 29.7 |
| | total | 101 | 100 |
| Age | 18–23 | 55 | 54.5 |
| | 24–28 | 23 | 22.8 |
| | 29 and more | 23 | 22.8 |
| Place of residence | village (less than 10 thousand people) | 10 | 9.9 |
| | town (10–99 thousand people) | 37 | 36.6 |
| | small city (100–300 thousand people) | 34 | 33.7 |
| | big city (over 300 thousand people) | 20 | 19.8 |
| Education | primary | 14 | 13.9 |
| | vocational | 50 | 49.5 |
| | secondary | 6 | 5.9 |
| | higher | 31 | 30.7 |

**Tab. 2.** Group sizes at given stages of treatment

| Stage | Abbreviation | Total | | M/F | | F/M | |
|---|---|---|---|---|---|---|---|
| | | N=101 | | N=30 | | N=71 | |
| | | Frequency | % | Frequency | % | Frequency | % |
| Before diagnosis and treatment | OPD | 19 | 18.8 | 4 | 13.3 | 15 | 21.1. |
| During diagnosis and treatment | OTD | 26 | 25.7 | 9 | 30 | 17 | 23.9 |
| During hormone replacement therapy | OTZ | 32 | 31.7 | 12 | 40 | 20 | 28.2 |
| After crucial surgery | OTO | 24 | 23.8 | 5 | 16.7 | 19 | 26.8 |

lowest during adolescence ($\bar{x}$ = 10.24) and increases in adulthood ($\bar{x}$ = 13.06). The results are presented in Table 4.

Few respondents are satisfied with their body shape. Of female-to-male persons at the first and second stages of diagnosis and treatment, only 4.2% declare satisfaction with their bodies. In these individuals at these two stages, satisfaction with their body shape correlated with physical activity (the first stage N=71, r=0.329, p<0.01; the second stage: N=56, r=0.33, p<0.05). In the subsequent stages (during hormone replacement therapy before and after crucial procedures), the percentage of female-to-male individuals satisfied with their bodies increased. In the third stage of diagnosis and treatment, 15.5% of respondents declared satisfaction with their body shape (the result correlates with physical activity in this period N=39, r=0.51, p<0.01). After the conclusion of treatment the percentage of satisfied persons increased to 21.1% and did not correlate with physical activity for this stage. As for the male-to-female group, 16.7% of respondents declared satisfaction with their body shape before diagnosis. In the second stage, this value declined to 10%. These results are not correlated with physical activity undertaken in these periods. Satisfaction with one's body increased to 30% in the next stage of treatment. This result correlates with physical activity (N=17, r=0.51, p<0.05).

In the group of male-to-female respondents, self-acceptance increased at the second and third stages of treatment (these results correlated with physical activity at these stages in a significant way) and then declined in individuals after crucial surgeries. As for female-to-male individuals, the rate of self-acceptance also increased at the second and third stages but remained the same for persons after crucial surgeries and during hormone replacement therapy.

The rate of female-to-male respondents declaring peer-acceptance was higher in each of the investigated periods compared to male-to-female individuals. In childhood, 59.2% of female-to-male persons and 36.7% of male-to-female individuals felt accepted by their peers. In adolescence, this rate declined in both groups (male-to-female: 13.3% and female-to-male: 28.2%), and then increased in adulthood, remaining higher for female-to-male persons (63.4% vs 43.3%). Moreover, the relationship between physical activity and peer-acceptance at different stages of development was also analyzed. In both male-to-female and female-to-male individuals, the perceived peer acceptance positively correlated with physical activi-

**Tab. 3.** Crucial surgery in the male-to-female and female-to-male group

| Sex | Procedure | Frequency | % |
|---|---|---|---|
| **M/F N=30** | Chondrolaryngoplasty | 2 | 6.7 |
| | Laser hair removal | 5 | 16.7 |
| | SRS (vaginoplasty) | 12 | 40 |
| | Facial feminization surgery | 4 | 13.3 |
| | Breast surgery | 2 | 6.7 |
| | Voice adjustment | 5 | 16.7 |
| **F/M N=71** | First surgery – mastectomy | 53 | 74.6 |
| | Second surgery – panhysterectomy | 4 | 5.6 |
| | Third surgery – neophalloplasty | 14 | 19.7 |

**Tab. 4.** Physical activity at various developmental stages and stages of diagnosis and treatment

| Stage | Total | | | M/F | | | F/M | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | $\bar{x}$ | SD | N | $\bar{x}$ | SD | N | $\bar{x}$ | SD |
| **Diagnosis and treatment** | | | | | | | | | |
| OPD | 101 | 3.9 | 2.41 | 30 | 3.77 | 2.5 | 71 | 3.96 | 2.39 |
| OTD | 82 | 4.09 | 2.46 | 26 | 3.46 | 1.9 | 56 | 4.38 | 2.64 |
| OTZ | 56 | 5.57 | 2.48 | 17 | 5.41 | 2.24 | 39 | 5.64 | 2.6 |
| OTO | 24 | 6.79 | 2.36 | 5 | 5 | 2.12 | 19 | 7.26 | 2.23 |
| **Developmental stage** | | | | | | | | | |
| Childhood | 101 | 10.86 | 4.94 | 30 | 8.67 | 4.87 | 71 | 11.79 | 4.7 |
| Adolescence | 101 | 10.03 | 4.22 | 30 | 9.53 | 3.94 | 71 | 10.24 | 4.34 |
| Adulthood | 74 | 11.8 | 4.8 | 24 | 9.17 | 4.5 | 50 | 13.06 | 4.46 |

ty undertaken at a given stage (male-to-female: N=30, r=0.43, p<0.01; female-to-male: N=71, r=0.75, p<0.01). In adolescence, average physical activity increased in the male-to-female group and was also significantly correlated with physical activity in this period (N=20, r=0.43, p<0.05). As for female-to-male individuals at the same developmental stage, physical activity declined compared with the previous stage, but it was not found to be correlated with peer-acceptance in this period. The activity of female-to-male persons increased in adulthood. This result showed moderate but statistically significant correlation with peer-acceptance in this period (N=50, r=0.34, p<0.05). No such correlations were observed for physical activity of female-to-male individuals, which decreased in adulthood compared with the level observed at the previous stage (Tab. 5). The analysis of variance did not demonstrate the diversification of the level of physical activity depending on developmental stages. Moreover, no such diversification was observed for four stages of diagnosis and treatment. However, attention must be paid to a very small sample in the group of respondents answering questions for the fourth stage of treatment, i.e. persons after crucial surgeries and during hormone replacement therapy (N=24). Therefore, the analysis of variance was also conducted with respect to three stages of diagnosis and treatment. It revealed the significant main effect F(2.48)=9.73; p<0.01; $\eta^2$=0.166. This means that in 16.6% of variance, physical exercise is explained by the stage of treatment when three stages undergo analysis. The post hoc analysis revealed that physical activity is the highest at the third stage of treatment (M=5.16; SD= 0.33), whereas physical activity at the second stage of treatment is significantly lower (M=3.78; SD=0.34); p<0.05 for both cases.

## DISCUSSION

The analyses revealed that physical activity of male-to-female individuals is higher than female-to-male persons at each stage of diagnosis and treatment. In the latter group, the level of physical activity increases with the transition to consecutive stages of treatment. This can be associated with the will to adjust the body shape to the identified sex, which becomes more and more prominent with each treatment or procedure. No similar relationships were noted for both female-to-male and male-to-female respondents with respect to the stages of development. Moreover, in the latter group, no such relationship was found with respect to the stage of diagnosis and treatment either.

Few transsexual respondents declared satisfaction with their bodies. Of female-to-male

**Tab. 5.** Correlations between physical activity in individual developmental stages with perceived peer-acceptance

| | | | Childhood | Adolescence | Adulthood |
|---|---|---|---|---|---|
| | | **N** | **30** | **30** | **24** |
| **M/F** | Physical activity | max<br>$\bar{x}$<br>SD | 16<br>8,67<br>4,873 | 20<br>9,53<br>3,94 | 18<br>9,17<br>4,5 |
| | Perceived peer-acceptance | % | 36,7 | 13,3 | 43,3 |
| | Physical activity and peer-acceptance | Pearson's r | 0,43** | 0,43* | 0,28 |
| | | **N** | **71** | **71** | **50** |
| **F/M** | Physical activity | max<br>$\bar{x}$<br>SD | 16<br>11,79<br>4,7 | 20<br>10,24<br>4,34 | 18<br>13,06<br>4,46 |
| | Perceived peer-acceptance | % | 59,2 | 28,2 | 63,4 |
| | Physical activity and peer-acceptance | Pearson's r | 0,75** | 0,18 | 0,34* |

*p<0,05; **p<0,01

respondents, the rate of satisfaction increased with each stage of diagnosis and treatment, with the ultimate value of 21.1%. At the first, second and third stages of diagnosis and treatment, declared satisfaction (or the lack of satisfaction) positively correlated with physical activity. In other words, the higher the physical activity at a given stage of diagnosis and treatment, the higher the satisfaction with one's body. No such correlations were observed for female-to-male individuals at the final stage of treatment (after crucial surgeries). This means that satisfaction with one's body at this stage may depend on other factors, such as the result of procedures and adjustment of the body to the identified sex. Physical activity at all stages of diagnosis and treatment before crucial surgeries can serve as a substitute of essential medical procedures. After such procedures have been performed, however, physical activity ceases to be the major factor of satisfaction with one's body to the benefit of the surgical outcome. In female-to-male individuals, the rate of persons declaring self-acceptance is lower than in male-to-female persons at all stages of diagnosis and treatment except for the last stage. However, a significant correlation with physical activity was observed only at the stage prior to diagnosis and treatment ($N=71$, $r=0.37$, $p<0.01$). At consecutive stages of diagnosis and treatment, the percentage of self-accepting female-to-male individuals exceeded the rate of persons satisfied with their bodies. This means that satisfaction with one's appearance is not a necessary condition for overall self-acceptance. Only after crucial surgeries was the rate of individuals satisfied with their body equal to the rate of persons declaring general self-acceptance.

Among male-to-female individuals, the percentage of patients satisfied with their bodies was higher than among female-to-male persons at all stages of diagnosis and treatment except for the stage after crucial surgeries. However, satisfaction does not change with the transition to the next stage of treatment. The highest percentage of respondents (30%) declare satisfaction with their body shape during hormone replacement therapy before crucial surgeries. After surgeries, this rate declines to 13.3% in male-to-female respondents. It must be noted, however, that this result cannot be a reliable indicator due to a very small sample size at this final stage ($n=5$). The percentage of respondents declaring self-acceptance increased from the first to third stage of treatment and surpassed the rate of persons satisfied with their bodies at the second and third stages.

As for the developmental stages, female-to-male individuals experience greater peer-acceptance than male-to-female persons at each of the analyzed stages. In both groups, this rate decreases in adolescence and then rises again in adulthood.

## CONCLUSIONS

1. Physical activity of male-to-female individuals is higher than that in female-to-male persons at each stage of diagnosis and treatment.
2. In less physically active female-to-male persons, correlations were found between physical activity and declared satisfaction with one's body.
3. In the male-to-female group, a significant correlation between satisfaction with one's body and physical activity was noted only at the third stage of treatment.
4. The rate of female-to-male respondents declaring peer-acceptance was higher in each of the investigated periods compared to male-to-female individuals.
5. The level of physical activity in transsexuals slightly varies depending on the stage of diagnosis and treatment. No diversity was observed with respect to the developmental stages.

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