

How well recognized is the Integral Theory?

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Abstract: Background, hypothesis and aim: The Integral Theory (IT) is a universal, ligament-based theory of pelvic floor function and dysfunction which encompasses organ prolapse, bladder, bowel and chronic pelvic pain dysfunction. The aim was to systematically analyse the applicability of the Integral Theory System (ITS) to publications in a pelvic floor journal. **Methods:** We chose a journal Pelviperineology journal www.pelviperineology.org (PPJ) which encompasses all aspects of the Integral Theory System's reach: Urology, Gynecology, Coloproctology, Perineology. We scanned every publication in PPJ over a two year period to check the applicability of the ITS to the paper in hand. **Results:** An analysis of manuscripts published in Pelviperineology journal (Volume 36 and 37), only 29 clinical research articles were included as being suitable for analysis. Among the 29 clinical research articles, only 11 (37.9%) mentioned IT and/or related articles as a reference. However, according to evaluation of the clinical papers with respect to the concordance with IT predictions, 26 (90%) manuscripts were regarded as being consistent with IT predictions. **Conclusions:** Our review indicates consistency with the Integral Theory in 90% of clinical papers, though almost 2/3 of these authors did not seem to be aware of the theory. Why? We can only speculate. One reason may be the difficulty in accepting that pathogenesis for bladder and bowel dysfunctions comes not from the organ itself, but from weak ligaments inactivating the opening and closure muscles which act on the ligaments.

Keywords: Integral Theory; Pelvic floor; Incontinence; Pelvic pain; Ligaments

INTRODUCTION

The Integral Theory (IT) is a ligament-based theory which has been presented as a universal theory of pelvic floor function and dysfunction¹. The first commercial application of the midurethral sling (MUS), the TVT, was based on the IT. The Integral Theory System (ITS) is a management system which includes a ligament based diagnostic and surgical system² and a squatting based pelvic floor system³. In its 2018 iteration, the Integral Theory states that pelvic organ prolapse (POP), chronic pelvic pain, and bladder and bowel dysfunction are mainly caused by collagen/elastin deterioration in 5 main suspensory ligaments and their vaginal attachments². The Integral Theory explains cure for POP, bladder and bowel dysfunction via the dual function of the ligaments: i.e., their role in pelvic organ suspension and as insertion points for three oppositely acting muscle forces. Lax ligament insertion points weaken muscle forces so they cannot adequately close the urethral or anal tubes (incontinence), evacuate them (constipation, bladder emptying problems), or tension the bladder and rectum sufficiently to prevent inappropriate activation of the micturition and defecation reflexes by peripheral stretch receptors (urinary and fecal urge incontinence)².

And relationship of symptoms to POP; The pictorial diagnostic algorithm accurately indicates which ligaments are damaged^{1,2}.

The aim of this review is to explore

1. The applicability of the Integral Theory System (ITS) to publications in a standard pelvic floor journal.
2. Whether the publications which qualified as "applicable" actually recognized the theory.

Table 1. Origin of country with respect to the correspondence of the authors per paper

Name of the country	Number of the correspondence	%
Australia	9	23
Israel	6	15.3
Italy	5	12.8
Brasil	5	12.8
Germany	2	5.1
Belgium	2	5.1
France	2	5.1
Venezuela	2	5.1
Other (S. Africa, Poland, Tanzania, Ethiopia, Argentina, Japan)	6 (one for each)	15.4

METHODS

We chose a journal which encompasses all aspects of the Integral Theory System's reach, Urology, Gynecology, Coloproctology, Pelviperineology journal www.pelviperineology.org (PPJ). We scanned every publication in PPJ over a two year period to check the applicability of the ITS to the paper in hand.

RESULTS

An analysis of manuscripts published in last 2 years of the pelviperineology journal (Volume 36 and 37) revealed overall 49 publications. With respect to the applicability of Integral Theory (IT), only 29 clinical research articles were included as being suitable for analysis⁶⁻³⁴. Besides these clinical data, 6 more manuscripts were regarded as opinion and/or hypothesis which though consistent with the Theory, were not included.

Among the 29 clinical research articles, only 11 (37.9%) mentioned IT and/or related articles as a reference. The country of origin of the authors was analysed (Table 1).

When the type of the clinical data was analyzed, retrospective papers were the most common type (n=11, 37.9%) followed by prospective non-randomized studies (n=9, 31%), cross-sectional (n=6, 20.7%) and case reports (n=3, 10.3%). All articles presenting clinical data were evaluated, critically analyzed and the presented data in them were summarized in Table 2.

The number of participants in these manuscript ranged between 1

Table 2. Analysis of the content of the clinical data

Parameter	Number of manuscripts that evaluated and/or presented such data	%
Focused on Lower Urinary Tract function	19	65.5
Focus on pelvic organ prolapse	6	20.7
Focus on bowel function	10	34.5
Focus on chronic pelvic pain	13	44.8
Sexual function evaluated	3	10.3
Tethered vagina evaluated	2	6.9
Obstetric injury evaluated	2	6.9
Stress urinary incontinence data presented	15	51.7
Urge incontinence data presented	11	37.9
Urinary evacuation problems presented	8	27.6
Anal incontinence data presented	9	31
Bowel evacuation problems presented	10	34.5

and 1143, making a total of 4961 individuals. In three of the manuscripts, these individuals also included males.

A validated patient evaluation questionnaire was used in 11 (37.9%) manuscripts. Quality of life evaluation was performed in 11 papers (not all the same manuscripts where a questionnaire was used). According to the diagnostic modalities used, one (3.4%) paper presented Q-tip test results, 5 (17.2%) used pad test, 5 (17.2%) used valsalva leak test, 7 (24.1%) used POP-Q, 2 (6.9%) used pelvic floor sonography, and 6 (20.7%) used urodynamic evaluation. Surgical results comprised the presented data in 10 of the manuscripts (34.5%). Of these, 6 evaluated mesh use and 4 evaluated repair without any mesh implementation.

According to evaluation of the clinical papers with respect to the concordance with IT predictions, 26 (90%) manuscripts were regarded as being consistent with IT predictions. For the 6 papers that were regarded as opinion/hypothesis, 3 of them were accepted to be consistent with the predictions of IT. The 3 clinical papers that were not applicable with IT were evaluated in detail. One was a retrospective and two were prospective non-randomised studies. One included male data and the number of the participants in this paper was between 16 and 55. None of these non-applicable papers were related to surgical data. In other words, all manuscripts presenting surgical data (n=10) were found to be consistent with the predictions of IT.

DISCUSSION

It is now almost 30 years since the IT was first published. We conclude that even though the most widely performed operation for SUI, the midurethral sling, (estimated 5,000,000 operations to date), is based on the IT, the IT itself was still not widely quoted in our review. Only half of the papers which qualified for inclusion mentioned the IT, even though the content of 90% of the papers examined was consistent with the IT or its predictions.

Everything in medicine is based on some sort of theory. The Burch Colposuspension was based on elevating the proximal urethra above the pelvic diaphragm into the "pressure transmission zone" where the pressure could be "equalized". "Detrusor overactivity" is thought to arise from some problem in the detrusor muscle, hence its treatment with drugs which suppress detrusor activity.

There are two universal pelvic floor theories in the literature, the Petros Integral Theory¹ and the Swash Unifying Theory⁴. Swash et al published "A unifying concept of pelvic floor disorders and incontinence" in 1985. Based on nerve conduction and other studies, Swash et al demonstrated that childbirth in patients who presented with urinary and fecal incontinence, the nerve supply to pelvic muscles was often damaged during childbirth⁴. The Integral Theory is a musculo-elastic theory where muscles contract against suspensory ligaments to open and close the urethral and anal tubes. Loose ligaments invalidated the 3 directional forces which open and close these tubes and control the evacuation reflexes¹. Different from the Swash Unifying Theory, the Integral Theory from day 1 has demonstrated surgical cure of symptoms by ligament repair. The best known example is the midurethral sling (MUS) which cures stress urinary incontinence (SUI) by pubourethral ligament repair with a tape. The Swash theory cannot explain cure of SUI by a MUS operation, nor the results of⁵.

Ligament or muscle? In a blinded histological/ surgical trial, 45/47 patients undergoing midurethral sling showed histological evidence of severe muscle damage, yet 89% were cured of their stress urinary incontinence (SUI) the day after surgery. It was concluded that ligament damage (pubourethral) was more important than muscle damage in the pathogenesis of SUI³.

The discussion of how theories can be validated or invalidated, become dominating or discarded are the province of the philosophy of science and are outside the scope of this paper. One validated example is said to be sufficient to invalidate a theory; the more radical a theory, the longer it takes to be accepted.

CONCLUSIONS

Our review indicates consistency with the Integral Theory as regards content of most clinical papers (90%), though almost 2/3 of

these authors did not seem to be aware of the theory, even though most likely a majority would use the midurethral sling operation which is based on the Theory.

We can only speculate at reasons for this discrepancy, the principal one being the inevitable difficulties encountered by a clinician in trying to come to grips with a completely foreign concept, a different paradigm, one where the pathogenesis for bladder and bowel dysfunction comes not from the organ itself, but from weakness in the suspensory ligaments of the pelvis.

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DISCLOSURE STATEMENTS

There was no conflict of interest. The authors of the publication did not receive any financial support by any grant/research sponsor.

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