Impact of OTT media on the society: insights from path analysis

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Abstract

Purpose – The proliferation of the internet has enabled over-the-top (OTT) media to spread rapidly. It is now at the threshold of creating a huge social impact. However, there have been no studies so far that have examined the impact of OTT media on society, family and individuals. This study proposes to investigate the same and discover its impact on the family, society and whether it has any effect on individuals' career or education and one's health.

Design/methodology/approach – Path analysis was used to investigate the patterns of the effect of OTT on the family and society. This method was chosen since it allows to examine the influences within a system of variables and gain insights into the OTT media's impact. The responses were collected through an online questionnaire.

Findings – The paper provides empirical insights into the impact of OTT media. It reveals some interesting and crucial insights on its influence.

Research limitations/implications – Because of the chosen research approach, the research results do not establish any causal relationships. Since the survey was conducted during the pandemic, further research during "normal" time is suggested.

Practical implications – The paper discloses the powerful and growing OTT media's significance.

Social implications – With watching OTT emerging very rapidly as a powerful channel of entertainment, what people see is very important. Hence, the purpose of this empirical study to investigate the influence of OTT media on individual, family and society is crucial and topical.

Originality/value – This paper fulfils an identified need to understand OTT media's influence.

Keywords OTT media, Path analysis, Social impact, Family and individuals, Society, Influence

Paper type Research paper

Introduction

Propelled by the lockdown caused by COVID 19, the over-the-top (OTT) market is emerging as a fast-growing market. Though it is at a relatively nascent stage, its worldwide market in 2019 was estimated at US$121.61bn, and it is expected to reach US$1039.03 in 2027, growing at a compound annual growth rate (CAGR) of 29.4% (Rake and Gaikward, 2021). Even the number of subscribers to Netflix, an OTT service provider, alone has surpassed the number of paid cable TV subscribers in the USA (Richter, 2017). OTT services can be described as the one that is delivered over online networks (Alrutz, 2018). The name is derived from the fact that these services ride on the top of an existing service (TRAI, 2015) that a customer already has. OTT does not require any broadcasting station, a cable connection or a satellite television platform (Endavo, 2021). Its content can be delivered through the internet and smart TVs PlayStation, Chromecast, Xbox, Fire Stick and other compatible hardware devices such as mobile and desktop devices (Li, 2017).

In this era of information technology (IT), the internet is the backbone of a country's economy (OECD, 2011). The growth of networks that allow integrated data, voice and video services over the internet (IP-networks) has enabled OTT providers to deliver their programmes directly to the end-users (Baldry *et al.*, 2014). Though there is no universally accepted classification of the services that are offered over the Internet, Figure 1 provides a classification of the same based on a broad set of use cases (Baldry *et al.*, 2014). The classification is not exhaustive because due to the World Wide Web's pervasiveness, it is not possible to classify all its uses. In the given Figure 1, mostly, the video and audio contents that
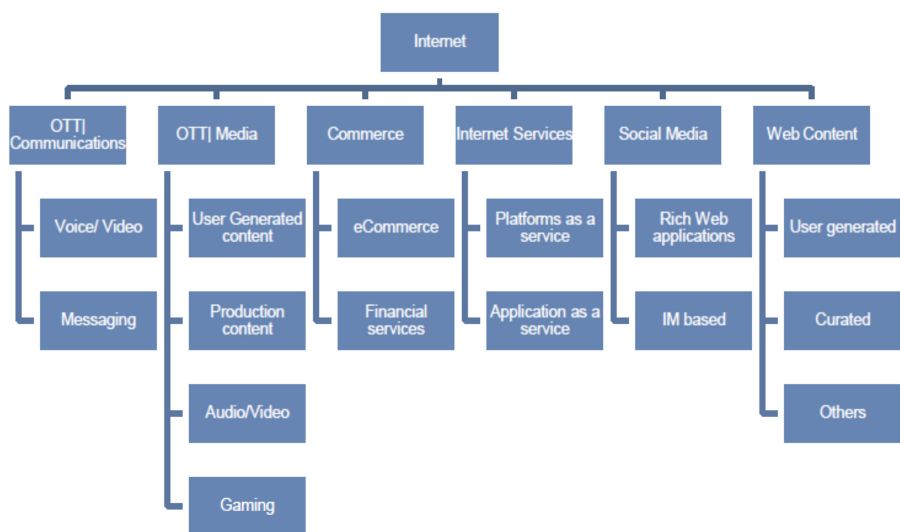
Figure 1.
Classification of
internet services based
on a broad set of
use cases

Source(s): Authors of The rise of OTT players – what is the appropriate regulatory response?
(Baldry, *et al*., 2014)

are being streamed over the internet have been classified as OTT media since "Media" is a term used to describe the tools that mediate human communications (Kim, 1998).

Figure 2 shows the growth of the internet globally. As per Cisco (2020), the number of internet users is estimated to be at a CAGR of 6% from 3.9 billion in 2018 to 5.3 billion by 2023, representing 51% of the world population in 2018 and 66% of the world population by 2023.

The proliferation of the internet, coupled with the lockdown due to pandemic, has enabled the OTT media to spread rapidly (Gupta and Singharia, 2021; Shin and Koh, 2017; Ghosh, 2017). Further, the greater the internet penetration, the greater is the demand for entertainment via the internet (Shin and Koh, 2017). Besides, this media has certain advantages too. It has opened up the possibility of streaming ad-free content and undisturbed viewing. The users can watch what they want and when they want and also where they want (Lee and Lee, 2015). In addition, OTT media offers curated video content suited to the needs and demands of individual consumers (Ikigai Law, 2019). Similar to e-commerce, OTT media
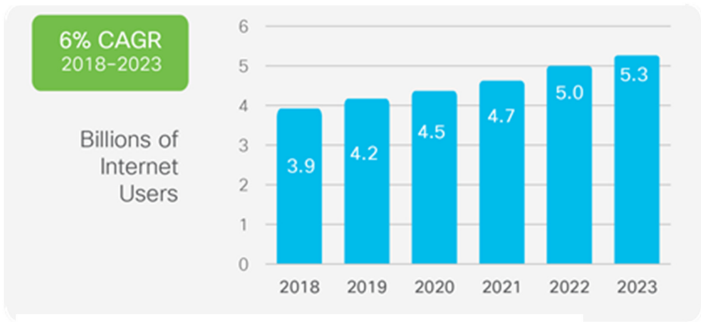

Figure 2.
Global internet user
growth

Source(s): Cisco Annual Internet Report, 2018-2023

too use recommendation agents to enable their viewers to choose the contents they want to watch to maximise their watching experience. Recommendation agents are software agents that are employed to make recommendations to the users after they gather, individual user's interests or preferences for products (Xiao and Benbasat, 2007). Like the recommendation agents increase the consumers' shopping satisfaction and loyalty (Yoon *et al.*, 2013), the same is true for OTT media also (Kwon *et al.*, 2021).

Another tool used by the OTT media to increase viewing is gamification (Paliwal, 2020). Gamification, not games, is one of the strong mechanisms to boost engagement on the platform. Besides mainstream gaming, movies, contents and the watching experience can be gamified. It can increase viewers' stickiness and would transform viewing into an interactive two-way process. Thus, it is now at the threshold of creating a huge social impact. Social impact is the effect on people and communities that appears as a consequence of an action or inaction, an activity, project, programme or policy (Parrett, n.d.). It has the potential to disrupt family harmony and its well-being. Family well-being refers to a "sense of wellbeing of the family, collectively and subjectively defined and informed by its members, in which individuals and family-level needs interact" (Zuna *et al.*, 2010). The extant literature is flooded with information on OTT media; however, a search for a similar title in EBSCO, JSTOR, PROQUEST and Google SCHOLAR databases did not yield any article that examined its impact on society, family and individuals. This study proposes to study the same. Therefore, the research questions are as follows:

RQ1. What is the impact of OTT media on the family and its well-being?

RQ2. How does OTT media impact society?

RQ3. How does OTT media impact the career or education of individuals? What is its impact on one's health?

The above research questions led to the development of a research model, which was tested with data, collected from 251 OTT users by administering an online survey to them. The data were analysed using pathway analysis. Due to a dearth of research on the impact of OTT media on society, family and individuals, the findings of this study are expected to be valuable to society.

Literature review
The OTT market is blossoming with local players taking an active part in it (Zabel *et al.*, 2019).

It is witnessing a growing number of new entrants; besides, Netflix, Amazon Prime Video and Disney+ new players such as Starz, Apple TV+, HBO Max, Discovery +, BookMyShow, Biigbang Amusement, to name a few, are all set to enter. As a consequence, the users are flooded with a deluge of programmes or contents to choose from. The contents, sometimes though, according to newspaper reports, have been on the wrong side of public sentiments (The Times of India - CNN, 2021). It is quite natural that some nations have their own laws to control the OTT media (Ikigai Law, 2019).

According to the "State of Online Video 2020" report by Limelight Networks, Inc., Indians spend on an average 11 h (10 h and 54 min to be precise) per week watching videos online, whilst the global average is 8 h (7 h 55 min) (Limelight Networks, 2020). In addition, Indians watch videos on the move, which is eroding their sleeping time and their travel (Moochhala, 2018). For people who spend more time on OTT platforms and social media, including Netflix, Twitter, Facebook and Instagram, sleeping hours for most people have dramatically plummeted, making them prone to depression, according to a recent study published in the journal *npj Digital Medicine* (Awasthi, 2021).

Another observation is the increasing popularity of OTT-based gaming activities. What is noteworthy is that while the number of long hours, pre- and post-COVID, for "gaming addicts" remained the same, it has almost doubled for the casual gamers. There has been a steep increase in casual gaming popularity from 23% of 1–6 h of gaming pre-COVID to 43% during the COVID period (ETBr and Equity, 2020a, b).

The "State of Online Video 2020" report finds that price is one of the major factors in consumer decision-making, and as per the report, 46% of Indian viewers said that they will cancel a streaming subscription due to high prices. This is in line with the global figure of 47%. With the technological advances and newer devices, together with a wide genre of programmes, the usage quickly reaches users data limit, following which high tariff applies. This has resulted in users receiving astronomical bills (Baldry et al., 2014).

The Data Sciences Division of Dentsu Aegis Network (DAN), India, in a report on the popularity of the OTT services in India, finds that "Binge Watching" as a culture is on the rise among Gen Z. On average, 49% of India's youth spend 2–3 h a day binge-watching (Dentsu Marketing Cloud Insights, 2020). All these factors affect the well-being of individuals. Hence, the first set of hypotheses are

H1. OTT media affects the individual's career or individual's education.

H1a. Watching more "Action" movies impacts individual.

H1b. Watching more "Romantic" movies impacts individual.

H1c. Watching more of "Comedy" movies impacts individual.

The socio-economic factors influence peoples' media consumption (Waterman et al., 2013). Also, their cultural values greatly impact what they like and watch (Park et al., 2017). Not long ago, in India and elsewhere, the family would gather to watch TV programmes or movies. This phenomenon has now undergone a sea change. Technology has disrupted this pattern, and along with it, the culture of watching together. The OTT provides wide contents such as movies, TV programmes, news, user-generated videos, music videos and sports (Keskin, 2018). They are now focusing on family issues to attract family audiences (Jha, 2021). According to the third edition of the *Indian Over-the-Top (OTT) Platforms Report 2020*, published by MICA Ahmedabad, men consumed the highest amount of OTT content in India in 2020. The number of male viewers is almost double of female viewers for Netflix. The same is true for Amazon Prime and Hot Star. "The least audience traffic is in the female age group 25–45", as per the report. The exception is the home-grown OTT platform Voot, which saw close to 51–52% of the female audience. Does this disparity among the genders in the family and children lead to any unpleasantness? To find the status, the second hypothesis is:

H2. OTT media affects the family.

The OTT market is not confined to just men and women only. Many OTT players are launching separate platforms for kids. Besides the adults, even the children, are attracted to OTT. According to *PwC Kids Digital Media Report 2019*, 33.33% of internet users globally and over 40% of new users are children (Shanthi, 2020). In a country like India with a diverse population and multitude of languages, the international players may feel handicapped. However, global majors like Amazon Prime Video, Netflix, Disney+ Hotstar have plenty of contents for the younger audience (Sarkar, 2020).

Because of people preferring to watch content mostly on OTT platforms and less in movie theatres (Chatterjee and Pal, 2020), certain movies producers and distributors are electing the OTT media to reach their target customers (Varghese and Chinnaiah, 2021). However, if the streaming speed is poor, it is set to affect both the customers and the content publisher (Usmani, 2018). OTT players, to provide the users with the experience of watching in a peer

group and overcome the boredom of watching alone, are now offering a new additional feature called "Group Watch"; it also known as community viewing or co-viewing. This feature enables a group of up to seven subscribers to view the content in sync and share their reactions simultaneously via emoji, etc. As more OTT players are offering this feature, co-viewing is set to grow. In fact, co-viewing can be good as it is social, emotional and enables families to bond and spend time together (Doshi, 2021). All these lead to the question of the impact of OTT media on the society. Therefore the third hypothesis is:

H3. OTT media affects society.

Further, as society is made up of individuals and families, they, in turn, will also impact society. Hence, the hypotheses are as follows:

H4. The family watching OTT media affects the society.

H5. The individuals watching OTT media affects the society.

Figure 3 presents the proposed research model in which the solid lines show the relations between the variables of interest where hypotheses were developed.

Research methodology
Survey administration
To test the research hypotheses, data were collected by administering an online survey to OTT watchers. To elicit genuine responses, a dichotomous opening question such as do you watch OTT programmes or not was deliberately avoided. The researcher felt that the respondents are likely to yes to take part in the survey (social bias). To circumvent this problem, a question was designed on the duration of viewing OTT contents and was intentionally placed in the second position. To deter the "statistical noise" associated with
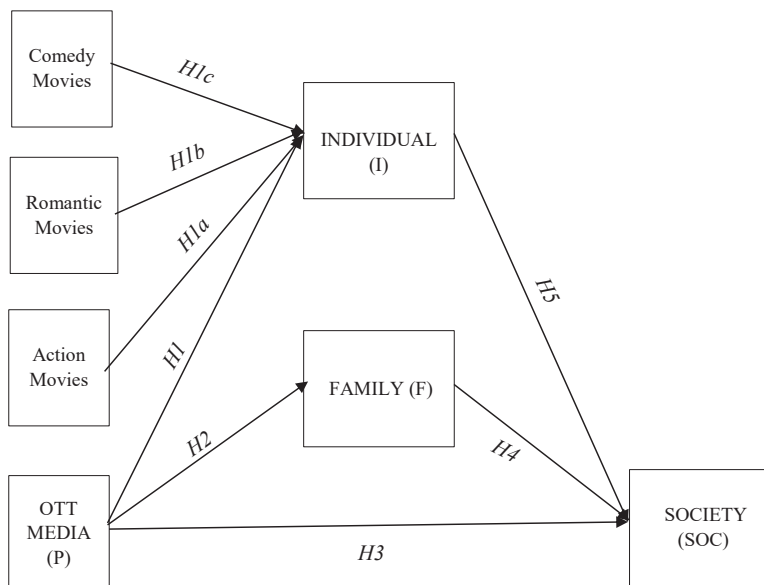

Figure 3.
Research model

subjects outside the population of interest, the inclusion criterion of the responses was the length of the duration of OTT viewing; it should not be less than 1 h per week.

The questionnaire designing demanded meticulous and iterative work. The measures were drawn from other similar scales and modified to suit the requirement of this study. With the help of faculty colleagues, items collected from the existing works were closely scrutinised and discussed. The questions were framed based on the items concerned mainly with social effects, family effects and individual effects. Most of the measurement items were asked on a five-point Likert scale. All the questions were in English. Since people who watched OTT were conversant with English, no necessity of translating them into any other language was felt. The questions, after discussions, were carefully worded.

The first version (V1) was scrutinised, which led to a second version (V2). This version was discussed with subject-matter experts, and on their suggestions, a third version (V3) was prepared. This was tried with a few people. With the feedback received, a fourth version (V4) was prepared and circulated among the faculty members and few students for testing. After receiving further suggestions for improvements, after minor changes in the wordings, the final version (V5) was prepared and released on 20 May 2021.

The questionnaire, besides the key research variables being studied in the research model, included control variables related to the demographic information of the respondents (e.g. age, gender, family stage, place of residence, family income and education) and OTT media usage (e.g. the number of hours viewing per week, the genre most watched and devices used to view OTT programmes). The demographic variables may influence users' OTT viewing behaviour. However, they were not of primary interest of this study, and so, no research hypotheses were developed with these variables.

The data were collected from 20 May to 29 May 2021, through Google Forms. In total, 251 responses were received and on cleaning the data, two were dropped for their unreliable responses, making it 249. All the responses that mentioned less than 1 h per week of viewing (22 responses) were dropped. After dropping those 22 responses, 227 responses were taken up for analysis. Table 1 shows the spread of the duration of OTT watching amongst the users.

The data consisted of 121 male (53%) and 102 women (45%). Four people (2%) preferred not to disclose their gender. The age distribution of the sample is as follows: teens – nine (4%), the 20s – 122 (54%), 30s – 58 (26%), 40s – 19 (8%), 50s (6%) and 601s – 6 (3%). The mean age of the respondents was 30.4. The same details are shown in Table 2.

Path analysis was used to quantify the impact of OTT on the individual, family and society. Since path analysis is used for model testing rather than model building (Streiner, 2005), this method was chosen. Also, it allows to investigate patterns of effect within a system of variables (Allen, 2017). Another reason for choosing path analysis is that it goes beyond regression; it is an extension of multiple regression that enables one to examine many final dependent variables in which one variable influences another, which in turn influences the third variable. In the research model shown in Figure 3, the OTT media, action movies, romantic movies and comedy movies are exogenous variables, and the

Variables	Details	Frequency ($n = 249$)	Percentage
Duration of watching OTT (per week)	Less than 1 h	22	8.8
	1–2 h	49	19.7
	2–4 h	65	26.0
	4–6 h	41	16.5
	6–8 h	19	7.6
	More than 8 h	53	21.0

Table 1.
Duration of OTT watching

Variables	Details	Frequency ($n = 227$)	Percentage
Gender	Male	121	53.3
	Female	102	44.9
	Prefer not to say	4	1.8
Age	Teens (less than 20)	9	4.0
	The 20s (20–29)	122	53.7
	The 30s (30–39)	58	25.6
	The 40s (40–49)	19	8.0
	50s (50–59)	13	5.7
	60s and more	6	2.6
Education	High schooling	10	4.4
	Graduation	63	27.8
	Postgraduation	119	52.4
	Professional	23	10.1
	Doctorate	12	5.3
Job	Working/self-employed	146	64.3
	Student	65	28.6
	Not employed/retired	16	7.1
Income	Less than 6 lacs per annum	69	30.4
	Between 6 and 12 lacs per annum	67	29.5
	Between 12 and 18 lacs per annum	38	16.7
	More than 18 lacs per annum	53	23.3

Table 2.
Profile of the
respondents

individual, family and society are endogenous variables; they are all represented by rectangles.

To begin with, the adequacy of sample size for analysing the research model was computed. The sample size is critical in determining the values of the paths, variances and covariances. All these parameters are associated with a standard error (SE) and a z-test; z-test is the ratio of the parameter to the SE. Subject matter experts recommend a minimum of ten cases for every parameter to be estimated (Kline, 2016). In this study, there are eight paths and seven covariances, i.e. 15 parameters in all to be estimated. That makes that the minimum sample size should be 150.

In addition, the sample size was calculated using G Power. The result for F-test, when the power ($1-\beta$ error probability) is 0.95, the α error probability is 0.05, the effect size of f^2 is 0.15 turned out to be a sample size of 129. Therefore, the sample size of 251 OTT users, which later shrank to 211, is adequate for path analysis.

The factors examined in the study were OTT media, individuals, family and society. The validity and reliability of the measurement were calculated. Table 3 shows the mean, standard deviation (SD) and Cronbach's alpha.

Following are the two main requirements for path analysis (Crossman, 2020):

(1) All causal relationships between variables must go in one direction only.

(2) The variables must have a clear time ordering since one variable cannot be said to cause another unless it precedes it in time.

Having fulfilled all the requirements for path analysis, the data were analysed using the lavaan package in R software.

Since, comedy, violent and sex movies are watched the most (Marketing Charts, 2019) and having hypothesised that OTT has impacts on individuals, families, society, analysis was done with the research model shown in Figure 3. The model included the variables – impact of OTT on individuals (individuals), impact of OTT on families (families), the impact of OTT on society (society), impact of comedy and OTT itself. To estimate the parameters, R software

was used. Because of a comfortably large sample size, the chi-square value was expected to be significant, and so, the model evaluation was based on the comparative fit index (CFI) (Stampfli *et al.*, 2010). However, the model yielded a non-significant chi-square value of 9.021, with df = 6, $p > 0.05$, but a high CFI value of 0.952. On scrutiny, it was discovered that the regression weight suggested between OTT and society is not significant. Therefore, this path was dropped, and the model was re-run. This process was repeated until the model included only the significant paths (at the significance level of 5%). The final model, as produced by R software, is shown in Figure 4.

Figure 4 shows the path diagram with the standardised regression weights of the corresponding variables. Table 4 shows the weights of the path along with SE and z-value. All are found to be significant. The other fit indices are shown in Tables 5a and b.

Variable	Details	Mean	SD	Cronbach's alpha
Unrest in the family due to watching OTT	Family	2.7	1.1	0.80
Arguments in the family due to watching OTT		2.2	1.2	
Unpleasant incidents in the family due to watching OTT		2.2	1.1	
Increased antisocial activities	Social	3.0	1.0	0.71
Meet friends less often due to watching OTT		2.6	1.2	
Watching OTT makes social bond weak		2.8	1.1	
Selfunwell	Individual	2.1	1.1	0.78
Missed office/academics due to watching OTT		2.2	1.2	
Feels could have done better in career/academics if not for OTT		2.3	1.3	
Watch OTT in office/college		2.5	1.1	

Table 3.
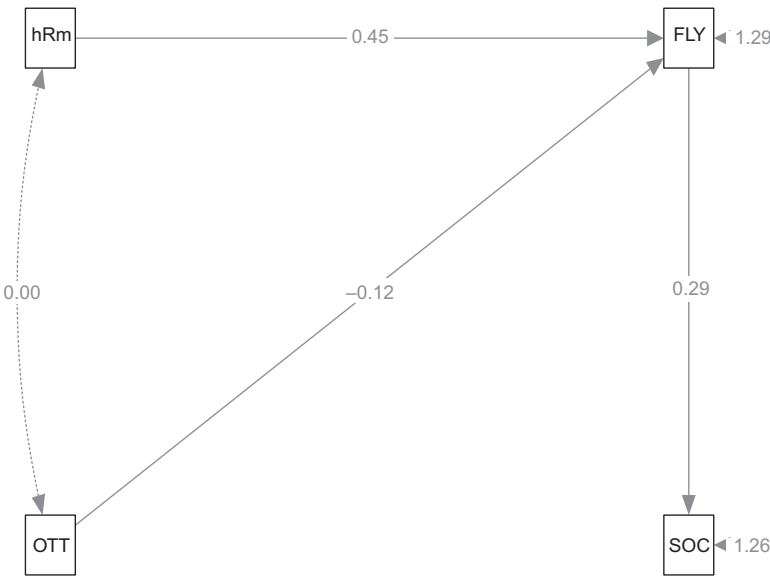Properties of
measurement scales

Figure 4.
The final model

hRm = Romantic movies, OTT = OTT media, FLY = Family, SOC = Society

Table 6 summarises the hypotheses status. This was achieved by running the model repeatedly until only the significant paths remained.

Discussion

Researchers suggest using the ratio of chi-square to degrees of freedom to test the goodness of fit of the model (Wheaton *et al.*, 1977). However, researchers differ in their recommendation, and some suggest using ratios between 2 and 5 to indicate a reasonable fit (Marsh and Hocevar, 1985). For others, ratios in the range of 3 to 1 are a reasonable

Descriptions	Estimate	Std. err	z-value	p(>|z|)
Paths				
SOC ~ FLY	0.290	0.067	4.350	0.00
FLY ~ OTT	−0.120	0.053	−2.261	0.024
FLY ~ hRomantic	0.450	0.238	1.888	0.059
Variances				
FLY	1.292	0.126	10.271	0.000
SOC	1.263	0.238	10.271	0.000

Table 4. The regression weights, SEs, z-value and p-values

a

Model	NPAR	CMIN	DF	p	CMIN/DF
Over-identified model	5	3.415	2	0.18	1.71

b

Default model – CMIN/Df	GFI (goodness of fit index)	CFI	TLI (Tucker–Lewis index)	RMR (root mean square residual)	SRMR (standardised root mean square residual)	RMSEA (root mean square error of approximation)
1.71	0.984	0.943	0.858	0.017	0.038	0.058

Table 5. Model fit summary in path analysis

	Hypothesised path	Stand. path coefficient	p-values	Hypothesis test
H1	Individual ~ OTT	Dropped during the initial examination. Not supported by empirical data		
H1a	Individual ~ Action movies	Dropped during the initial examination. Not supported by empirical data		
H1b	Individual ~ Romantic movies	Dropped during the initial examination. Not supported by empirical data		
H1c	Individual ~ Comedy movies	Dropped during the initial examination. Not supported by empirical data		
H2	Family ~ OTT	−0.120	0.024	Supported
H3	Society ~ OTT	Dropped during the initial examination. Not supported by empirical data		
H4	Society ~ Family	0.290	0.000	Supported
H5	Society ~ Individual	Dropped during the initial examination since individual is not supported by the data		

Table 6. Summary of hypotheses status

measure for an acceptable fit between the proposed model and the data (Carmines and McIver, 1981), and some say that if the ratio is larger than 2.00, it does not indicate a good fit (Byrne, 1989). The CMIN/DF ratio in this study is l.71. Besides, the goodness of fit (GFI) and CFI are well above 0.90, indicating good model fit (Hu and Bentler, 1999). The Tucker–Lewis index (TLI) is slightly below 0.9 at 0.858, which is considered as in the acceptable range. Further, RMSEA values less than 0.05 are considered to be good, values between 0.05 and 0.08 are acceptable, values between 0.08 and 0.1 are marginal, and values greater than 0.1 are poor (Fabrigar *et al.*, 1999). Absolute indexes of model fit, root mean square residual (RMR) (0.017), standardised root mean square residual (SRMR) (0.038) and root mean square error approximation (RMSEA) (0.058), all are small and in the acceptable range. These indicate that the final model is in good fit with the data.

Standardised path coefficients for the final model redrawn with the same paths as emerged in the R software are shown in Figure 5.

Conclusions

There is a saying, "What a man sees, he thinks. What he thinks, he talks. What he talks, he does, and what he does, he becomes". With watching OTT emerging very rapidly as a powerful channel of entertainment, what people see is very important. Hence, the purpose of this empirical study was to investigate the influence of OTT media on individuals, family and society and also the impact of the different genres such as comical, romantic and action programmes. No previous study or studies have examined these aspects of OTT.

To present the empirical results, a survey was conducted using the internet and a questionnaire. The results were analysed. The first thing that is observed is that 80% of the respondents were young and in their 20s and 30s. Also, 26% of the respondents watched OTT for 2–4 h a week, while 21% watched for more than 8 h a week. Further, 42% watched on a smartphone, 25.6% watched PC and laptop, 25.4 watched on smart TV and the rest about 7% on tablet and other devices. In addition, 55% (41% agree + 14% strongly) agree that they are going to theatres less frequently than earlier. Though this inference matches with the earlier studies, as the data for this were collected during the pandemic situation, the researcher holds back a temptation to draw any conclusion on this data point.
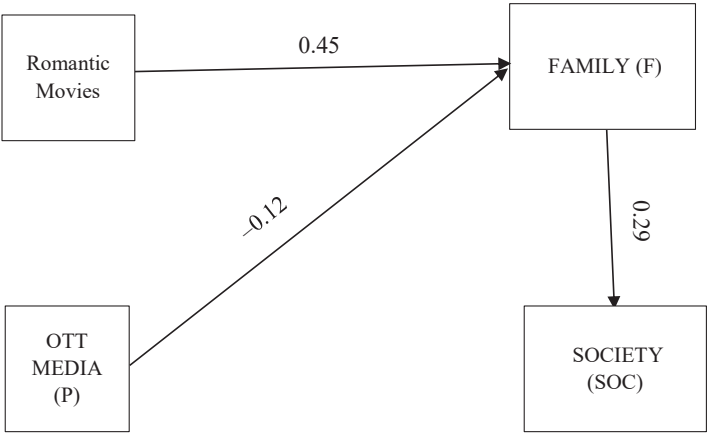

Figure 5.
The final
research model

Of the respondents, 52% were postgraduates, 28% were graduates. Professionals accounted for less than 10%. Also, 60% of the respondents earned between INR6 to INR18 lacs per annum. Among the characteristics of OTT media's impact on individuals, family and society, only its impact on the family was found to be significant. What is noteworthy is that the impact of OTT media on an individual's health and his or her career or education is not significant. Though individuals are the primary target of the OTT programmes, they manage themselves well enough not to be affected by it. This may be so because mostly educated and well to do people watch OTT, they are intelligent and resourceful enough to not suffer much from it and avoid its negative impact. However, collectively, as a family, OTT has its influence and on society indirectly via the family. Some unrest in a family may be attributed to OTT watching and some antisocial activities may be traced back to OTT watching. However, these statements may need further research.

There are at least two learnings from this study. First, OTT media impacts family's more than individuals. The individuals have succeeded in keeping its impact at bay so far. Second, it impacts society albeit indirectly via family. Some antisocial activities may be traced back to OTT watching.

Limitations
This study has some limitations. Firstly, this study was conducted during the pandemic lockdown. Hence, the responses were subject to the influence of the lockdown. Secondly, most of the data were collected came from urban areas as indicated by the place from which the respondents had answered the questionnaire. This is by chance and not by choice. Lockdown played the spoilsport and prevented data collection from the place of choice. Thirdly, path analysis is not for establishing causal relations nor can it establish whether a specific model is correct. It tells us whether the data are consistent with the model (Streiner, 2005). To arrive at the causal relations, one needs to compare this model with another model. Fourthly, other confounders such as self-control, family discipline, liking to watch TV programmes and demographic variables were not considered in the study might have influence. Finally, the generalisability of the results could be questioned due to the use of an online survey.

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